

# **Manganese Health Research Program: Recent published literature**

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**March 2008 - May 2008**

**June 2008**

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# Introduction

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This report presents the bibliographic details of papers identified as being first published during the period March 2008 to May 2008.

The papers were selected because they address research areas that are considered of direct relevance to the health effects of manganese (Mn); in order to aid review, the papers are presented under the following categories:

**Section 1 - EXPOSURE MEASUREMENT AND MODELLING:** Papers relating to the measurements or modelling of environmental and occupational Mn exposure, the development of biomarkers of exposure or effect.

**Section 2 - HEALTH EFFECTS:** Papers on the influence of Mn on health, disease and dysfunction.

**Section 3 - MECHANISM:** Papers on the physiological, biochemical and cellular mechanisms underlying the toxic effects of Mn.

**Section 4 - HUMAN SUSCEPTIBILITY:** Papers relating to assessment of the influence of genetic and epigenetic factors on human susceptibility to the effects of Mn.

**Section 5 - TREATMENT AND IMAGING:** Papers on the development and implementation of new medical approaches to the treatment of excessive Mn exposure.

**Section 6 - MISCELLANEOUS:** Other papers considered of interest or potential relevance to the study of the health effects of Mn.

The papers presented herein were identified using a series of structured searches of the following on-line databases: Medline, Toxline, Biological Sciences and Proquest Health. The paper abstracts were reviewed and categorised by an experience Scientist to confirm their relevance before inclusion in this report.

Future reports will present literature published during subsequent 3-monthly (quarterly) intervals.

# 1. EXPOSURE MEASUREMENT AND MODELLING

Kazi, T.G., Afridi, H.I., Kazi, N., *et al.* (2008) Copper, Chromium, Manganese, Iron, Nickel, and Zinc Levels in Biological Samples of Diabetes Mellitus Patients. *Biological Trace Element Research*, 122(1), 1-18.

Spiegel-Ciobanu, V.E. & McMillan, G. (2008) Manganism, Parkinson's Disease and Welders' Occupational Exposure to Manganese - Part 1: Sources of Manganese Exposure and its Role and Function in Human Health and Disease. *Welding Research Abroad*, 54(NUMB 1), 13-17.

Spiegel-Ciobanu, V.E. & McMillan, G. (2008) Manganism, Parkinson's Disease and Welders' Occupational Exposure to Manganese - Part 2: Manganese as a Neurotoxicological Risk to Welders. *Welding Research Abroad*, 54(NUMB 1), 30-35.

Vigeh, M., Yokoyama, K., Ramezanzadeh, F., *et al.* (2008) Blood Manganese Concentrations and Intrauterine Growth Restriction. *Reproductive Toxicology*, 25(2), 219-223.

## 2. HEALTH EFFECTS

El-Gammal, M.I. (2007) Risk Health Assessment of Manganese and Other Major Welding Fume Components among Welders. *Journal- Egyptian German Society of Zoology*, 54(PART A), 195-222.

Stepens, A., Logina, I., Liguts, V., *et al.* (2008) A Parkinsonian Syndrome in Methcathinone Users and the Role of Manganese. *New England Journal of Medicine*, 358(10), 1009.

Vigeh, M., Yokoyama, K., Ramezanzadeh, F., *et al.* (2008) Blood Manganese Concentrations and Intrauterine Growth Restriction. *Reproductive Toxicology*, 25(2), 219-223.

### 3. MECHANISM

Bock, N.A., Paiva, F.F., Nascimento, G.C., *et al.* (2008) Cerebrospinal Fluid to Brain Transport of Manganese in a Non-Human Primate Revealed by MRI. *Brain Research*, 1198, 160-170

Bonny, J.M., Mailly, P., Renou, J.P., *et al.* (2008) Analysis of Laminar Activity in Normal and Injured Rat Spinal Cord by Manganese Enhanced MRI. *NeuroImage*, 40(4), 1542-1551.

Çakatay, U., Kayali, R., Kiziler, A.R., *et al.* (2008) Postmitotic Tissue Selenium and Manganese Levels in Alpha-Lipoic Acid-Supplemented Aged Rats. *Chemico-Biological Interactions*, 171(3), 306-311

Canals, S., Beyerlein, M., Keller, A.L., *et al.* (2008) Magnetic Resonance Imaging of Cortical Connectivity in Vivo. *NeuroImage*, 40(2), 458-472.

Deng, X-H., Feng, S-W. & Wang, Z-Q. (2008) Effects of Manganese on Monoamine Content of Midbrains in Male Rats. *Chinese Journal of Public Health -Shenyang-*, 24(1), 0095-0096.

Fitsanakis, V.A., Zhang, N., Anderson, J.G., *et al.* (2008) Measuring Brain Manganese and Iron Accumulation in Rats Following 14 Weeks of Low-Dose Manganese Treatment using Atomic Absorption Spectroscopy and Magnetic Resonance Imaging. *Toxicological Sciences*, 103(1), 116-124

Hirata, Y., Suzuno, H., Tsuruta, T., *et al.* (2008) The Role of Dopamine Transporter in Selective Toxicity of Manganese and Rotenone. *Toxicology*, 244(2-3), 249-256

Kim, S., Park, E., Kim, S.J., *et al.* (2008) Differential Role of Mitogen-Activated Protein Kinases in Response to Manganese Treatment in Substantia Nigra Dopaminergic Neurons. *Journal of Health Science*, 54(2), 244-249.

Li, X-J. & Yan, Y-J. (2007) Review on the Neurotoxicity Mechanism of Manganese. *Chinese Journal of Industrial Medicine*, 20(6), 396-398.

Lima, P.D., Vasconcellos, M.C., Bahia, M.O., *et al.* (2008) Genotoxic and Cytotoxic Effects of Manganese Chloride in Cultured Human Lymphocytes Treated in Different Phases of Cell Cycle. *Toxicology in Vitro*, 22(4), 1032-1037.

Nong, A., Teeguarden, J.G., Clewell, H.J., 3rd, *et al.* (2008) Pharmacokinetic Modeling of Manganese in the Rat IV: Assessing Factors that Contribute to Brain Accumulation during Inhalation Exposure. *Journal of Toxicology and Environmental Health - Part A*, 71(7), 413-426.

Yin, Z., Aschner, J.L., dos Santos, A.P., *et al.* (2008) Mitochondrial-Dependent Manganese Neurotoxicity in Rat Primary Astrocyte Cultures. *Brain Research*, 1203, 1-11

Zhang, F-L., Xu, Z-F. & Gao, J. (2007) Effect of Manganese Chloride on Energy Metabolism of Brain Mitochondria of Rat. *Chinese Journal of Industrial Medicine*, 20(6), 367-369.

## **4. HUMAN SUSCEPTIBILITY**

No relevant papers identified

## 5. TREATMENT AND IMAGING

Canals, S., Beyerlein, M., Keller, A.L., *et al.* (2008) Magnetic Resonance Imaging of Cortical Connectivity in Vivo. *NeuroImage*, 40(2), 458-472.

Park, H.K., Kim, S.M., Choi, C.G., *et al.* (2008) Effect of Trientine on Manganese Intoxication in a Patient with Acquired Hepatocerebral Degeneration. *Movement Disorders*, 23(5), 768-770.

Spiegel-Ciobanu, V.E. & McMillan, G. (2008) Manganism, Parkinson's Disease and Welders' Occupational Exposure to Manganese - Part 1: Sources of Manganese Exposure and its Role and Function in Human Health and Disease. *Welding Research Abroad*, 54(1), 13-17.

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## 6. MISCELLANEOUS

Hardy, I.J., Gillanders, L. & Hardy, G. (2008) Is Manganese an Essential Supplement for Parenteral Nutrition? *Current Opinion in Clinical Nutrition and Metabolic Care*, 11(3), 289-296.