

*Scientific Study****Science Close to Confirming Biomarkers for Multiple Chemical Sensitivity***

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Science is getting closer to developing reliable biomarkers to diagnose multiple chemical sensitivity (MCS) as an organic disease process.

Relevant alterations of normal detoxifying activities have been identified in patients with MCS when compared with controls. These alterations involve catalase, glutathione-transferase and peroxidase.

“The finding of relevant alterations of catalase, glutathione-transferase and peroxidase detoxifying activities significantly correlating with clinical manifestations of MCS, has recently registered some progress towards the identification of reliable biomarkers of disease onset, progression, and treatment outcomes,” say scientists Chiara De Luca and colleagues in a well cited newly published peer-reviewed study reviewing MCS, *“The Search for Reliable Biomarkers of Disease in Multiple Chemical Sensitivity and Other Environmental Intolerances”*

De Luca cites a fast increase of new onset food and environmental allergies, as well as environment-associated disabling conditions, including MCS, fibromyalgia, chronic fatigue syndrome, electric hypersensitivity, amalgam disease, and others.

De Luca says that these conditions share the features of poly-symptomatic multi-organ cutaneous and systemic manifestations that are thought to be an inherited/acquired impaired metabolism of chemical/physical/nutritional xenobiotics that trigger adverse reactions at exposure levels far below what is thought to be toxicologically-relevant values.

MCS diagnosis is currently based on the inclusion criteria after exclusion of any other known organic cause, and on the Environmental Exposure and Sensitivity Inventory (EESI), a standardized instrument for measuring self-reported chemical sensitivities.



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Several countries have already taken steps to recognize MCS as a disease process. Germany, Austria, and Japan have listed it as a recognized disease in a local modification of the ICD (International Classification of Diseases)-10 code issue by the World Health Organization. Sweden has recognized electromagnetic field sensitivity as a functional syndrome. The USA has been slow to recognize any environmental illness in the ICD; however, several state agencies and medical associations have acknowledged MCS as a disability.

MCS is not allergic or immune in nature and research is now establishing biomarkers that point towards free radical/antioxidant homeostasis disturbances.

De Luca says, “Available data provide indirect evidence, awaiting further confirmation, that functional or/and genetic defects of endogenous enzymes detoxifying peroxides or stable toxic products of lipid oxidation like 4-HNE, may cause chronic oxidative stress and consequent metabolic alterations characteristic for the patients with MCS.”

Identifying biomarkers and mechanisms for MCS will help to lead to better treatments.

“Today, the only therapeutic approach with demonstrated beneficial effects is exposure avoidance, with the consequent complex task of removing putative indoor triggers from the living environment, often impossible in working and public places,” says De Luca.

Another researchers, Martin Pall, PhD., says that “therapy should focus on down-regulating the cycle biochemistry, rather than on treatment of symptoms.”



Pall has developed a therapeutic approach involving numerous agents that are predicted to down-regulate the cycle. He also cites similar approaches developed by several physicians. Most of the agents used in the approach have been identified through clinical trial and clinical observation. His approach includes a combination of:

- Vitamin C (ascorbic acid)
- Tocopherols/Tocotrienols
- Selenium
- Carotenoids
- Flavonoids
- Reductive stress relieving agents
- Mitochondrial regeneration agents
- L-Carnitine/Acetyl-L-carnitine
- Hydroxocobalamin/B₁₂
- Folic acid
- Vitamin B₆/pyridoxal phosphate
- Riboflavin
- Other B vitamins
- Glutathione/glutathione precursors
- α-Lipoic acid
- Magnesium
- SOD minerals/zinc, manganese, copper
- NMDA antagonists
- Riluzole
- Taurine
- Inosine/uric acid
- Long chain omega-3 fatty acids
- Agents that lower NF-κB activity
- Curcumin
- Algal supplements
- Hyperbaric oxygen
- Minocycline and Other Tetracyclines
- Creatine
- Lowered vanilloid activity
- Carnosine
- TRH
- D-ribose
- Ecklonia cava extract

De Luca concludes that, “Based on present available information, selected therapeutic proposals based on active antioxidant/chelator/gene- and immune-modulating principles, able to selectively prevent formation and release of excess reactive species or hydro- or lipid-peroxides, and to enhance specific detoxification pathways through ROS/RNS modulation, are to be taken into consideration for future clinical trials, which will be possible only if and when appropriate medical infrastructures with specific environmental requirements will be provided for these patients on the large scale.”