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## *Garth L Nicolson*

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### **Membrane lipid replacement for enhancing mitochondrial function and improving fatigue, pain and other symptoms in aging patients**

Loss of function of mitochondria, the key cell organelle responsible for approximately 90% of cellular energy production, can result in cell death, excess fatigue, pain, and other symptoms that are common problems in almost if not all age-related chronic diseases as well as advanced age. These diseases include neurodegenerative diseases, diabetes and metabolic syndrome, cardiovascular diseases, autoimmune diseases, neurobehavioral and psychiatric diseases, musculoskeletal and gastrointestinal diseases, fatiguing illnesses, cancer and chronic infections, among others. The mitochondrial function also declines in advanced age. At the molecular level reductions in mitochondrial function occur when there is a loss of mitochondrial maintenance of inner membrane trans-membrane potential due to oxidative damage by Reactive Oxygen Species (ROS) as well as loss of critical mitochondrial co-factors, resulting in reduced efficiency of the electron transport chain and less generation of ATP. Membrane Lipid Replacement (MLR) using an all-natural nutritional supplement mixture containing membrane glycerolphospholipids can be used to repair mitochondrial inner membrane damage, improve inner mitochondrial membrane trans-membrane potential and mitochondrial function, reverse ROS damage and increase the efficiency of the electron transport chain. Recent clinical trials have shown the benefits of MLR in enhancing mitochondrial function, reducing fatigue, pain, and other symptoms while improving mood and cognition. For example, mitochondrial function and inner membrane trans-membrane potential have been enhanced by 25-35%, resulting in decreases in fatigue by 35-45% in aging chronically ill patients in clinical trials. MLR has also been used to reduce the adverse effects of cancer chemotherapy and improve symptoms other than fatigue in chronic illness patients.

### **Biography**

Garth L Nicolson is the Founder, President, Chief Scientific Officer and Professor Emeritus of Molecular Pathology at the Institute for Molecular Medicine in Huntington Beach, California. He was formally the David Bruton Jr Chair in Cancer Research and Professor and Chairman at the University of Texas MD Anderson Cancer Center in Houston, and he was Professor of Internal Medicine and Professor of Pathology and Laboratory Medicine at the University of Texas Medical School at Houston. He has published over 650 medical and scientific papers, including editing 20 books, and has served on the Editorial Boards of 30 medical and scientific journals and was Senior Editor of four. Professor Nicolson has won many awards, such as the Burroughs Welcome Medal, Royal Society of Medicine (United Kingdom), Stephen Paget Award, Metastasis Research Society, U.S. National Cancer Institute Outstanding Investigator Award, and the Innovative Medicine Award, Canada. He is also a Colonel (O6, Honorary), U.S. Army Special Forces and a U.S. Navy SEAL (Honorary) for his work on Armed Forces and veterans' illnesses.

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