

Antioxidant Activity of New Natural Antioxidants: Free Radical Scavenging Activity and Inhibition of Human LDL Oxidation and Lipid Peroxidation

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Oxidative stress, induced by free radicals, is believed to be a primary factor in various diseases as well as in the normal processes of aging. The reactive oxygen species (ROS) can easily initiate the peroxidation of membrane lipids, leading to the accumulation of ROS. ROS are known to be a cause of diseases such as cancer, neurodegenerative disease, heart disease and inflammation, etc. Oxidative modification of plasma lipoproteins, particularly low-density lipoprotein (LDL), plays an important role in the initiation of atherosclerosis. Oxidatively modified LDL within arterial walls or in the serum is believed to be the formation of lipid-laden foam cells. Natural antioxidants can inhibit oxidative modification and prevent atherosclerosis. The generation of ROS can be inhibited by enzymatic and non-enzymatic mechanisms. Free radical scavengers and antioxidants are the non-enzymatic defense system against oxidative stress and have been reported to have biological activities such as anticancer, antiinflammation and prevention of coronary heart disease. The importance of antioxidants in human health has become increasingly clear due to spectacular advances in understanding the mechanisms of their reaction with oxidants. There has been growing concern over the safety and toxicity of synthetic antioxidants such as BHA and BHT. For these reasons, there is increasing interest in the natural antioxidants. The utilization of antioxidants is an important strategy to prevent the progression of disease caused by free radicals. New potent antioxidants can also serve as leading compounds for designing new active substances. Therefore, the identification and development of antioxidants from natural sources are beneficial and desired. In the course of our search for potent antioxidants as a therapeutic and preventive agent against the diseases caused by oxidative stress, we have developed a number of novel antioxidants from various natural sources such as microbial metabolites, mushrooms, and plants. On this time, antioxidant activities such as free radical scavenging activity, antiphotoxidation activity, and inhibition of lipid peroxidation, human LDL oxidation and glutamate-induced neurotoxicity of several novel antioxidants such as melanocins (from *Euphenicillium shearii*), inoscavin A (from the mushroom *Inonotus xeranticus*), davidianones and mansonones (from the plant *Ulmus davidiana*) and some other natural antioxidants will be discussed.