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<AT>**Role of Enzymatic free radical scavengers in management of Oxidative stress and Autoimmune Disorders**

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<ABS-HEAD>Highlights ► Causes and pathogenesis of autoimmune disorders ► Role of oxidative stress in cause of Autoimmune disorders ► Therapeutic potential of antioxidant enzymes superoxide dismutase and catalase for treatment of Autoimmune Disorders ► Novel delivery approaches used for treatment of Autoimmune Disorders

<ABS-HEAD>**Abstract**

<ABS-P>Autoimmune disorders are distinct with over production and accumulation of free radicals due to its undisclosed genesis. The cause of numerous disorders as cancer, arthritis, psoriasis, diabetes, alzheimer's, cardiovascular disease, Parkinson's, respiratory distress syndrome, colitis, crohn's, pulmonary fibrosis, obesity and ageing have been associated with immune dysfunction and oxidative stress. In an oxidative stress, reactive oxygen species generally provoke the series of oxidation at cellular level. The buildup of free radicals in turn triggers various inflammatory cells causing release of various inflammatory interleukins, cytokines, chemokines, and tumor necrosis factors which mediate signal transduction and transcription pathways as nuclear factor- kappa B (NF-κB), signal transducer and activator of transcription 3 (STAT3), hypoxia-inducible factor-1 (HIF-1α) and nuclear factor-erythroid 2-related factor (Nrf2). The imbalance could only be combat by supplementing natural defensive antioxidant enzymes such as superoxide dismutase and catalase. The efficiency of these enzymes is enhanced by use of colloidal carriers which include cellular carriers, vesicular and particulate systems like erythrocytes, leukocytes, platelets, liposomes, transferosomes, solid lipid nanoparticles, microspheres, emulsions. Thus this review provides a platform for understanding importance of antioxidant enzymes and its therapeutic applications in treatment of various autoimmune disorders.

<KWD>Keywords: Oxidative stress;;; autoimmune disorders; antioxidant enzymes; inflammation; novel systems.

<H1>1. Introduction

In normal physiological conditions there is balance between generation of oxidants and antioxidant cellular defense mechanism. Differences between proportion of antioxidants to the production of oxidants i.e. reactive oxygen species (ROS), and their reactive metabolites causes oxidative stress in aerobic species. Oxidative stress causes increased production of ROS like superoxide anion and hydroxyl radical during pathophysiological conditions and lowers generation of antioxidant resources which imbalances and injures healthy tissues followed by lipid peroxidation and alteration at cellular level. Body also reverts to this reaction by stimulating

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