

Effect of Phytochemicals on Free Radicals Formation and BDNF in Humans

by **Dr. Boris Nemzer**

Senior Director, Research and development and quality assurance at VDF FutureCeuticals, Inc (Momence, IL, USA), Professor, Department of Food Science and Human Nutrition at University of Illinois at Urbana-Champaign (USA)

Host: Dr. Huang Dejian Date: 18th Jan, 2016, Monday
Time: 12pm to 1pm Venue: Seminar Room S16-04-30



Abstract

Epidemiological studies of last decade describing the different protective mechanisms of herbal ingredients which able to inhibit oxidative stress and improve nitric oxide production, are responsible for protective effects of cardiovascular system. Aim of this study was to compare different types of herbal formulations characterized with antioxidant activity on their effects to inhibit generation of reactive oxygen species (ROS) and on in vivo circulating NO concentrations.

22 healthy in the age of 40±10 years old volunteers consumed single dose of different herbal formulations with different content of biologically active ingredients such EGCG, quercetin, anthocyanins, proanthocyanins and vitamin C. Antioxidative capacities of herbal formulations were characterizes by ORAC-5 assay. Formation of ROS was performed in capillary blood of volunteers before and 1, 2, 3h after of single dose herbal formulations administration. Electron spin resonance spectrometer E-SCAN analysis of bioavailable NO concentration and TNF-alpha dependent inflammatory response assay have been used.

In this study we found the different capacity of formulated herbal blends to inhibit in vivo generation of ROS, to elevate circulating NO concentration and to inhibit inflammatory response of human blood cells due to the different mechanism of action of their bioactive ingredients

The possible interaction between brain-derived neurotrophic factor (BDNF) and oxidative stress markers (OSM) has not been investigated enough. This study aimed to provide phytochemical composition, antiradical activity and perform to assess the effect of whole coffee fruits extract (WCFE) on blood levels of BDNF in healthy humans.

A single dose of WCFE significantly decreased a cellular and mitochondrial ROS formation, inhibited generation of extracellular NADPH oxidase-dependent superoxide (O₂⁻) and peroxidase-dependent hydrogen peroxide (H₂O₂). WCFE increased BDNF plasma level in patients by an average of 137% with respect to baseline (range 65-222%; P=0.001 v. placebo). WCFE could be used to inhibit ROS formation and other oxidative stress markers and for modulation of BDNF-depend health conditions to support an optimal health in humans.

About the speaker



Prof-Dr. Boris Nemzer is the senior director of research and development and quality assurance at VDF FutureCeuticals, Inc (Momence, IL, USA), professor in the Department of Food Science and Human Nutrition at University of Illinois at Urbana-Champaign. He received his B.S and M.S in chemical engineering in 1982 and Ph.D. degree in physical chemistry in 1986. Dr. Nemzer have authored and co-authored more than 140 publications in physical, analytical, bio and food chemistry. Dr. Nemzer is on the editorial board of three scientific journals. He is the co-editor of the special issues "Recent developments on free radicals and natural antioxidants research" "Recent Developments of Phytochemicals Effect on Brain-Derived

Neurotrophic Factor" at American Journal of Bio Medical Sciences and book "Sprouted Grains – nutritional values, production, and applications". Dr. Nemzer is reviewer for 28 scientific journals and affiliated with different academies, scientific societies and associations. Dr. Nemzer is co-chair of the bio-active compounds committee at AACCC International and an active member of the dietary supplement committee at AOAC. In 2015 he was awarded as honored professor of University of Science and Technology Beijing. His work focuses on chemical composition of natural products and their metabolites, spearheads one of the industry's most advanced botanical identification programs including processed ingredients and functional blends. He also works on nutritional and bio-active compounds composition of sprouted grains and seeds, antioxidant activity of natural products and their effects on free radicals production in humans. Dr. Nemzer provided international clinical studies on effect of dietary supplements on oxidative stress markers in humans.