Sameh S Ali, J Nanomed Nanotechnol 2014, 5:5
http://dx.doi.org/10.4172/2157-7439.S1.017

OMICS Group Conferences
Accelerating Scientific Discovery

4th International Conference on
Nanotek & Expo

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Biomedical applications of water soluble fullerenes: How do they work?

Sameh S Ali
Zewail City of Science and Technology, Egypt

Fullerenes (buckyballs) are small-size molecules with unique chemical and biomedicinal properties. One of the most promising classes of water-soluble fullerenes is carboxyfullerenes as the high symmetry and partitioned lipophilic/hydrophilic characteristics of each molecule appear to enhance its ability to access various domains in the cell. These compounds have been shown to pass the blood-brain barrier and even to penetrate mitochondria thus acting as an antioxidant at the primary source of reactive oxygen species. The tris-malonic acid fullerene derivative C3 has been shown to remove superoxide radicals catalytically rather than stoicheometrically thus acting as a superoxide dismutase mimetic. The extraordinary neuroprotective efficacy of this molecule has been established in several models including iron-induced oxidative injury, NMDA-receptor mediated neurotoxicity, familial amyotrophic lateral sclerosis and ketamine-induced loss of interneurons implicated in schizophrenic patients. Strikingly, administration of C3 to wild-type mice starting at middle age improved their cognitive function and extended their lifespans. In the current presentation we will elaborate on the molecular mechanism by which these compounds act as super-antioxidants. Elucidation of the mechanism is expected to provide guidance for the development of effective fullerene-based drugs to intervene with the plethora of nervous system maladies-particularly, those involving oxidative injury.

Biography

Sameh S Ali is the Founding Director of the Center for Aging and Associated Diseases, Helmy Institute of Medical Sciences, Zewail City of Science and Technology. He returned to Egypt from the University of California in San Diego in June 2012 to participate in establishment of Egypt's National Project. He is a formally trained physical chemist but his interest in free radical biology and medicine started in 2003 while exploring the extraordinary antioxidant properties of fullerenes in vitro and *in vivo*. During his work in the Department of Medicine in the University of California San Diego the period from 2005-2012, he contributed to many projects in the field of mitochondria function and free radical biology and medicine. His work produced over 40 highly cited articles in high-impact journals including Science, Proceedings of the National Academy of Sciences, Aging Cells, Antioxidant and Redox Signaling, FASEB J, J Neurosciences, Free Radical Biology and Medicine, etc. He acts as an Executive Editor for the Journal of Nanomedicine & Biotherapeutic Discovery, an Associate Editor for BMC Research Notes, Editor for BMC Biology, and Editor for the Journal of Analytical Sciences, Methods, and Instrumentation.

sameh.ali@zewailcity.edu.eg