The oxidative stress initiated mitochondrial DNA over proliferation and deletion in the context of the cancer and neurodegeneration: Recent challenge in neuropharmacology

It has been postulated that Alzheimer disease (AD) and cancer are systemic processes, which involve multiple pathophysiological factors. Nitric oxide- (NO-) dependent oxidative stress appeared to be key pathway that results in mitochondrial ultrastructural alterations and DNA damage in cases of Alzheimer disease (AD) and may be in other pathology. However, little is known about these pathways in human cancers, especially during the development as well as the progression of primary brain tumors and metastatic colorectal cancer. One of the key features of tumors is the deficiency in tissue energy that accompanies mitochondrial lesions and formation of the hypoxic smaller sized mitochondria with ultrastructural abnormalities. We theorize that mitochondrial involvement may play a significant role in the etiopathogenesis of cancer. Recent studies also demonstrate a potential link between AD and cancer, and anticancer drugs are being explored for the inhibition of AD-like pathology in transgenic mice. Severity of the cancer growth, metastasis, and brain pathology in AD (in animal models that mimic human AD) correlate with the degree of mitochondrial ultrastructural abnormalities. Recent advances in the cell-cycle reentry of the terminally differentiated neuronal cells indicate that NO-dependent mitochondrial abnormal activities and mitotic cell division are not the only important pathogenic factors in pathogenesis of cancer and AD, but open a new window for the development of novel more specific and target based treatment strategies at least for these devastating diseases.

Biography
Gjumrakch Aliev, President “GALLY” International Biomedical Research Institute Inc., San Antonio, Texas, USA. He also hold appointment with the University of Atlanta, Atlanta, Georgia, USA as a Professor of Cardiovascular, Neuropathology, Gerontology, Health Science and Healthcare Administration. He authored and coauthored more than 500 publications in the fields of neurodegenerative diseases research (Alzheimer disease), as well as cardio and cerebrovascular disease, cancer, and electron microscopy. He is nationally and internationally reputed in his area. His accomplishments in the area of biochemistry and cellular biology have tremendous implications for drug design towards CNS Neurological Disorders, AD, cancer, and cerebrovascular and neurodegeneration related pathologies. He is world-renowned expert in electron microscopy. He has worked has been published in numerous prestigious journals such as Nature Clinical Cardiology, J. Neuroscience, Circulation Research, New England Journal of Medicine, Blood, J. Cellular and Molecular Medicine, Atherosclerosis, CNS Neurological Disorders & Drug Targets, International J. Biochemistry and Cell Biology, and many others which reflect his leading role in his research areas. He is currently the Editor in Chiefs for “Central Nervous System Agents in Medicinal Chemistry”, “Applied Cell Biology”, “World Journal of Neuroscience”, “Open Journal of Psychiatry” and “Journal of Aging Science”, Cardiovascular & Hematological Agents in Medicinal Chemistry as well as which by itself shows the voluminous and outstanding work he has accomplished in the area of cellular and molecular biology as well as aged associated clinical sciences. He is one of most cited authors in his fields with high impact factors.

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