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### Nicotine-derived compounds as new and selective therapeutic tools against post-traumatic stress disorder

It has been well documented that Post-Traumatic Stress Disorder (PTSD) is an anxiety disorder that develops after experiencing trauma. Unfortunately, actual therapies do not help majority of patients with PTSD. Moreover, extinguished fear memories usually reappear in the individuals when exposed to trauma cues. New drugs to reduce the impact of conditioned cues in eliciting abnormal fear responses are urgently required. Cotinine, the main metabolite of nicotine, decreased anxiety and depressive-like behavior, and enhanced fear extinction in mouse models of PTSD. Cotinine, considered a positive modulator of the  $\alpha 7$  nicotinic acetylcholine receptor ( $\alpha 7$ nAChR), enhances fear extinction in rodents in a manner dependent on the activity of the  $\alpha$ nAChRs. Cotinine stimulates signaling pathways downstream of  $\alpha 7$ nAChR including the protein kinase B (Akt)/glycogen synthase kinase 3 $\beta$  (GSK3 $\beta$ ) pathway and the extracellular signal-regulated kinases (ERKs). The stimulation of these factors promotes synaptic plasticity and the extinction of fear. In this lecture, we will discuss the hypothesis that cotinine relieves PTSD symptoms and facilitates fear memory extinction by promoting brain plasticity through the positive modulation of presynaptic nAChRs and its effectors in the brain.

### Biography

Gjumrakch Aliev, MD, PhD is the President of "GALLY" International Biomedical Research Institute Inc., San Antonio, Texas, USA. He also holds appointment with the University of Atlanta, Atlanta, Georgia, USA as a Professor of Cardiovascular, Neuropathology, Gerontology, Health Science and Healthcare Administration, and Leading Researcher in the Institute of Physiologically Active Compounds, Russian Academy of Sciences, Chernogolovka, Moscow Region, Russia. He received his MD in 1982, from the Baku Medical University (former USSR) with *cum laude*. Then, he accomplished his PhD in Cardiovascular Diseases from the prestigious Russian Academy of the Medical Sciences, Moscow, Russia in 1988 with *cum laude*. He received Post-doctoral Training with Professor G. Burnstock in the University College of the London. 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 an outstanding Teacher, Scholar and a Renowned Scientist in the area of cellular molecular physiology, and cardiovascular and neurodegeneration-mediated pathologies and drug development including Alzheimer's disease. He is nationally and internationally reputed in his area.

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