“NanoTherapy for Parkinson’s disease: A nicotine complex prevents neuronal damage and reverses electrophysiological function”
Presented by Dr. Syed Imam

Abstract

The pathophysiology of dopaminergic (DA) loss in Parkinson’s disease (PD) is still unclear. Lack of effective therapies maybe due to limitations in our understanding of the molecular and cellular events leading to degeneration of the nigrostriatal DA system. Here, we report that a combination of Nicotine and NanoCeria presents an outstanding case of prevention of PD progression, in a 1-methyl-4-phenylpyridinium (MPP+) induced in vitro model of PD in primary human dopaminergic neurons. A co-treatment of Nicotine and NanoCeria significantly inhibited MPP+ induced inhibition of parkin expression and prevented the aggregation of a-synuclein suggesting a regulation of protein degradation pathway. More importantly, in a functional electrophysiological analysis using Multi-Electrode Array, we report for the first time that this therapeutic combination of Nicotine and NanoCeria was not only able to prevent MPP+ induced loss of neuronal function but also was able to significantly reverse it towards normal. Our data might suggest an efficacious role of Nicotine-NanoCeria combination for the prevention of neuronal loss and restoration of neuronal function during PD progression. Additional in vivo work will be required to validate these significant findings.