

A Multi-Approach Investigation to Evaluate Compounds that Mitigate Neuroinflammation

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Parkinson's disease is a progressive neurodegenerative disorder, which affects the basal ganglia and the activity of dopamine, a neurotransmitter in the brain. This interruption of dopamine appears to provide an explanation as to the loss of motor function by those who have Parkinson's disease (PD). 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) is a prodrug to MPP+, a known neurotoxin which induces Parkinsonian symptoms to those exposed to it. The goal of this study was to: 1) to investigate the potential for nicotine and velvet bean extract to protect against MPTP-induced neurotoxicity and 2) to establish a zebrafish (*Danio rerio*) model to study these effects of nicotine and L-DOPA from velvet beans. Using high performance liquid chromatography, the concentration of velvet bean L-DOPA, a precursor to dopamine, was determined. In cell culture studies, the effects of nicotine or velvet bean extract on reducing neuroinflammation was then investigated. In behavioral experiments, the effects of nicotine and MPTP are being investigated. Reports from the American Academy of Neurology suggest that people who smoke cigarettes are ~44% less likely to develop Parkinson's disease, compared to those who have never smoked this research can help elucidate nicotine's putative role in mitigating inflammation associated with PD.