Analysis of a neuroprotective candidate compounds against Parkinson´s disease using the SH-SY5Y cell model

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Parkinson's disease is the second most common neurodegenerative disease worldwide with no effective treatment. It is mainly characterized by the loss of dopaminergic neurons in the *substantia nigra*. While a comprehensive understanding of the molecular mechanisms involved in the pathogenesis of this disease is still missing, growing evidence indicates that oxidative stress and mitochondrial dysfunction, caused by the inhibition of mitochondrial complex I, could contribute to the cascade of events that leads to the degeneration of dopaminergic neurons. In this study we evaluated a novel marine natural compound, BMT2, and its analogue, BMT2´, as antioxidant candidates against Parkinson´s disease. To mimic the cellular environment of this pathology, we used the well-known human neuroblastoma cell model SH-SY5Y treated with neurotoxic compounds such as 6-OHDA and MPP^+. The neuroprotective capacity of the natural compounds was tested in comparison to the widely used antioxidant, N-Acetyl-L-Cysteine and it was assessed by performing cell viability assays (MTT and Alamar Blue), mitochondrial dysfunction assays using the mitochondrial membrane depolarization assay (JC-1) or by analyzing mitochondrial morphology with Mitotracker. BMT2 and BMT2' showed efficient antioxidant properties and emerge as promising candidates for neuroprotection therapeutic strategies.