NEUROABSTRACTS

MANF, ER STRESS, AND THE PATHOPHYSIOLOGY OF PARKINSON'S DISEASE

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Mesencephalic astrocyte-derived neurotrophic factor (MANF) is a critical protein that promotes the survival of midbrain dopaminergic neurons and has therefore been implicated in the pathophysiology of Parkinson's disease. MANF mainly localizes in the ER and plays a major role in maintaining ER homeostasis, specifically by stopping the unfolded protein response (UPR) during ER stress and preventing the cell from undergoing apoptosis. Lentiviral-mediated shRNA MANF knockdown in the substantia nigra of male Sprague Dawley rats led to the development of motor deficits and the manifestation of Parkinson's-like symptoms, as shown via the beam transversal test, fixed-speed rotarod test, and the assessment of local asymmetry through the cylinder test. The binding immunoglobulin protein (BiP), activating transcription factor 4 (ATF4), and transcription factor C/EBP homologous protein (CHOP) play a major role during ER stress and the UPR, and are used as ER stress and apoptosis markers. PCR quantification of ER stress through the analysis of BiP, ATF4, and CHOP mRNA showed elevated ER stress levels and apoptosis following MANF knockdown. The increased levels of ER stress and apoptosis led to the death of midbrain dopaminergic neurons and suggest that MANF is involved in the pathophysiology of Parkinson's disease.

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DO THE BENEFITS OF RETRIEVAL PRACTICE REMAIN UNDER STRESS?

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The testing effect demonstrates that long-term memory is better encoded when the learning period is devoted to retrieving rather than restudying information. Recent research regarding this effect has found that encoding information through restudying leaves subsequent retrieval vulnerable to stress, whereas studying information by practicing retrieval protects later retrieval from stress. The current study seeks to replicate these findings using ecologically valid materials, while investigating whether protection against stress, developed by practicing retrieval, remains after completing a more difficult task. This experiment employed a 2x2 between-participant design. On the first day, participants learned a prose passage by either repeatedly restudying the passage (SSSS) or by practicing retrieval following an initial study session (SRRR). They returned two days later to complete either the Trier Social Stress Test or a control analogue. Afterwards, they recalled the passage and subsequently completed a set of multiple-choice questions. The results displayed an inoculation against stress for participants retrieving for the final free recall, but stress was observed to affect participants when answering the multiple-choice questions. Stress impairments were seen on the multiple-choice questions regardless of learning strategy, suggesting a dependency of the testing effect on automatization.