The Reduction of Alzheimer’s Disease through the Activation of Sirtuin 1 by Resveratrol

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Alzheimer`s disease is one of the leading causes of death and affects millions of people worldwide. Since this form of dementia has such a large impact on the human population, it is imperative that a treatment be found as soon as possible. Alzheimer`s disease has two main characteristics: amyloid-ß concentration and tau neurofibrillary tangles. This study measures the effects of varying amounts of resveratrol, an activator for SIRT1, on the amyloid-ß concentration and the transcription levels of SIRT1, BACE1, tau protein, and p65 in neuro-2a cells. The rationale for this study is that if resveratrol decreases the tau protein and amyloid-ß concentration, then it can possibly be considered a treatment method for reducing the effects of Alzheimer`s disease in patients. The hypothesis was that as the amount of resveratrol augments, there would be decreased transcription levels of BACE1, p65, and tau protein as well as reduced amyloid-ß concentration. The process for conducting this experiment involved growing neuro-2a cells, treating the cells with 0 µM, 5 µM, 30 µM, or 200 µM of resveratrol, treating cells with either 0 µM or 10 µM of amyloid-ß, counting cells, determining cell viability, using real-time reverse transcription-polymerase chain reaction with SIRT1, p65, BACE1, and tau protein, utilizing an ELISA assay for measuring the amyloid-ß concentration, and analyzing the results. The results showed that resveratrol did not lower the amyloid-ß concentration compared to the controls with no resveratrol. Resveratrol downregulated p65 and the tau protein. Above optimal levels of resveratrol decreased BACE1 expression.

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