Examining the Effects of Over-the-Counter Supplements on Paralysis Rates of Caenorhabditis elegans Exhibiting Alzheimers-Like Amyloid-ß Plaques

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Alzheimer's disease is a neurodegenerative disorder strongly tied to Amyloid-ß aggregation, leading to cellular dysfunction and an inhibition of movement. In the Caenorhabditis elegans CL2006 model, similar Aß protein buildup induces age-dependent paralysis. This study investigated how metabolic antioxidants influence paralysis rates as an indicator of neuroprotection. Specifically, Vitamin C and epigallocatechin gallate (EGCG) were compared against untreated controls. Over the period of six days, CL2006 worms were exposed to antioxidant-treated or non-treated NGM plates. To measure paralysis rates, a double-blind method was implemented in which only members unaware of plate labeling collected paralysis data, thereby reducing observer bias. Data analysis was performed with a log-rank test, the industry standard statistical method for comparing survival timelines. Both treatments yielded significant results compared to the positive control. EGCG versus control yielded p = .0011, while Vitamin C versus control yielded p = .004, allowing rejection of the null hypothesis. By Day 6, both treatments were associated with approximately 25% more non-paralyzed worms relative to the control. These findings strongly suggest that metabolic antioxidants significantly reduce Aß-induced paralysis within C. elegans. Overall, this study supports the use of metabolic regulation in mitigating amyloid toxicity and highlights the effectiveness of C. elegans as a model.

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