The Effect of Neuroglobin and Aldehyde Dehydrogenase on TBI-Induced C. elegans

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Traumatic brain injuries (TBIs) are one of the most common issues found in the emergency room setting, with over 69 million people sustaining some form of TBI every year. Despite the millions of individuals worldwide facing the terrible repercussions of TBIs, there is still no effective pharmacological treatment to aid in short- and long-term neurological recovery. However, researchers are looking towards a proper solution within the use of brain-specific proteins and exosomes. In previous research done by Wolfe-Herman in 2018, the researcher performed a scratch assay on neural stem cells (NSCs) adding exosomes with the proteins aldehyde dehydrogenase (ALDH) and neuroglobin (NGB), to the cell wells to observe the scratch closure rate. With the addition of the combined exosomes, there was a 50% increase between the controls and the individually stamped exosomes and a 476% increase between the controls and combined exosomes. In this continuation, the effectivity of these two proteins will be tested on C. elegans after they were induced with a TBI to test the individual effect of these proteins on a larger animal model. Results concluded that the ALDH condition trended with an overall significant decrease (p-value< 0.05) in mortality and a significant increase (p-value< 0.05) in the rate of movement of the nematodes after injection in comparison to the control, thus reaffirming the potential of these specific proteins for the improvement of post-TBI patients to aid with neuro-restoration when put in combination with the exosomes.

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