Impact of Klotho Gene Variability and DNA Methylation on Traumatic Brain Injury Outcomes

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Traumatic brain injury (TBI) affects about 1.7 million individuals annually. It is one of the leading causes of death and disability in the U.S. The Klotho gene, which plays an important role in normal cognitive function and longevity, may influence patient outcomes after TBI. It was hypothesized that DNA variability and DNA methylation within the Klotho gene would significantly impact TBI outcomes. Discovery data collection led to a follow-up allelic discrimination that assessed DNA variability. Group-based trajectory analyses were used to quantify DNA methylation. Regression analyses were run to relate DNA variability and methylation to TBI outcomes. The discovery analysis discovered one SNP, rs508394, that showed significance to death at 3 and 12 months after TBI ($p=0.048$, 0.016) and disability ($p=0.046$) at 3 months after TBI. While there was no significance observed between DNA methylation and TBI outcomes, the Klotho methylation trajectory plots provided insight into the genetic basis of recovery after TBI. Together, these findings may be important when evaluating Klotho as a potential biomarker for TBI outcomes, thereby furthering our knowledge on genetics-based therapies.