

## **B4**

**Title: Analyzing patterns of gene expression in inflamed microglia stimulated with a pro-inflammatory molecule (TNF Alpha)**

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It has been well documented by medical studies that in neurodegenerative diseases such as Alzheimer's, Parkinson's, and Multiple Sclerosis, inflammation can be both a complex and important factor in the progression, as well as the effects, of the disease. However, the effect of these diseases on genomic patterns within inflamed cells has not been well documented. The purpose of this experiment was to observe the patterns of gene expression within intergenic regions using microglia, with a control group and a sample that had been manipulated to overexpress levels of the NRA2 gene, which changes a cells response to inflammation. Within each group, there was a set of cells treated with tumor necrosis factor alpha, a pro-inflammatory molecule. The manipulated genes were labeled A2, unmanipulated named VT (vector). The treated samples had the tag 24h, indicating they had been treated for 24 hours, and the untreated had the tag of Unt. An interstitial probe was created to find unusual reads within intergenic genes, which were then compared with scatterplots made from the overall data. The results found were that the presence of the TNF alpha agent resulted in the high differentiation of genes within the four samples, and the overexpression of the NRA2 gene resulted in a much lower level of differentiation between the samples. Overall, when untreated with the tumor necrosis factor, and unmanipulated with overexpression of the NRA2 gene, there is a higher level of expression of reads in regard to undiscovered genes within the inflamed microglia.