

Exploring Phosphatase Targets in Alzheimer's Disease: A Comprehensive Sequence and Gene Expression Analysis

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Background: Alzheimer's Disease (AD) is a complex, genetically heterogeneous neurodegenerative disorder and is the leading cause of age-related dementia. It primarily affects thinking, memory, and behavior, causing significant cognitive decline. Early diagnosis is crucial for improving care and reducing the disease's emotional and financial burden. Phosphatases play a key role in AD onset and progression, with protein phosphatases (PPs) linked to amyloid-beta plaque accumulation and neurofibrillary tangles (NFTs), hallmark features of AD. Reduced levels of PP1 and PP2A contribute significantly to AD. Identifying phosphatases involved in AD could offer new biomarkers for early diagnosis and therapeutic targets to halt or slow disease progression. Objective: This study aims to identify novel phosphatases implicated in AD, providing insights into their role in disease progression and potential targets for diagnosis and treatment.

Methods: We conducted an extensive review of existing literature on phosphatase involvement in AD. Using PamGene chip technology, we identified phosphatase substrate sequences associated with AD. These sequences were analyzed through the NCBI BLAST tool to identify related genes. We then used the Kaleidoscope bioinformatics platform to cross-reference our findings with published studies, ensuring a comprehensive analysis of phosphatase involvement in AD.

Results: Our initial analysis identified nine genes potentially involved in AD, supported by 26 related studies. Further data collection and analysis are ongoing, with plans to incorporate additional data sources and assess gene expression patterns in AD using the Kaleidoscope platform.

Conclusion: Our findings highlight the need for further investigation into the role of phosphatases in AD. The initial data reveal a gap in the current understanding of how phosphatases influence AD progression. By identifying specific phosphatase targets, we hope to provide insights into potential therapeutic strategies and diagnostic tools for AD.

Keywords: Alzheimer's Disease, Phosphatases
