



Neuroinflammation as a Driver of Alzheimer's Disease Pathogenesis

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Background

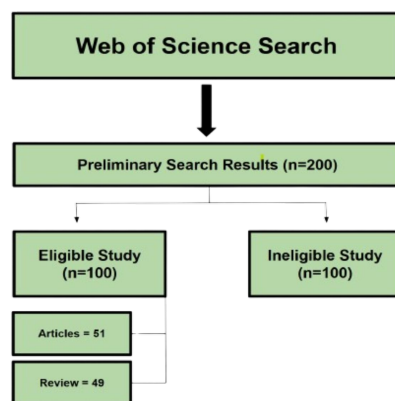
Alzheimer's disease is the leading cause of dementia and memory loss worldwide. This can be explained by the accumulation of amyloid-beta proteins and tau protein tangles, leading to neurodegeneration. Recent data have shown that neuroinflammation is a primary driver rather than a side effect of Alzheimer's. There is a substantial need for more targeted strategies to address neuroinflammation and, in turn, neurodegeneration.

Objectives

The objective of this study is to examine how neuroinflammation affects the progression of Alzheimer's disease by analyzing highly cited research and related biological processes.

Methods

Using the Web of Science database, 200 preliminary studies were obtained based on three primary keywords: Alzheimer's disease, neurodegenerative diseases, and inflammation. After extensive screening for relevance, the final set comprised 51 studies and 49 review articles.



Results

Following the review of extracted articles and the creation of relevant figures, immune response was found to be the biological process that contributes the most (35%) to Alzheimer's Disease. This was followed by lipid metabolism (25%), the process of breaking down lipids and fats; the amyloid/tau hub, where amyloid-beta fragments began to aggregate; and endocytosis (both 20%). Immune response is the biological reaction to foreign material and to eliminate unknown substances. Lipid metabolism breaks down fats and lipids to maintain structures. Amyloid-beta can form into extracellular plaques and impede communication and nutrient transport.

Figure 1. Senior Authors with Multiple Papers within the Top 100 Most Cited Papers

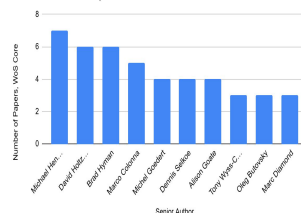


Figure 3. Journals with multiple Top 100 most cited papers

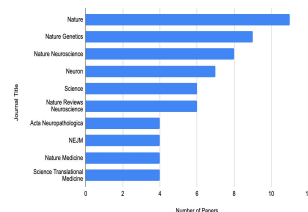


Figure 2. Most Cited Senior Author Institutions in the Top 100 Most Cited Papers

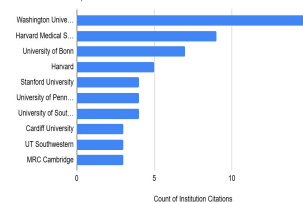
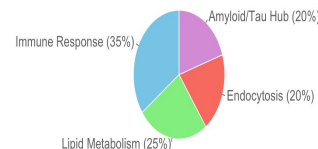


Figure 4. Percentage of Biological Processes that Affect Alzheimer's Disease



Discussion

Inflammation in the brain plays a large role in Alzheimer's disease development. The results of biological processes, particularly lipid metabolism and immune response, suggest that brain inflammation is a key factor in disease progression. Therefore, analyzing these processes can help scientists and researchers identify better ways to treat or slow the progression of Alzheimer's disease.

References

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