

Lay Summary

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Multi-species biofilm formation in senile plaques in Alzheimer's disease: Contribution from oral bacteria

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During the development of Alzheimer's disease, proteins build up in the brain to form structures called 'plaques' and 'tangles'. This leads to the loss of connections between nerve cells, and eventually to the death of nerve cells and loss of brain tissue. This means that gradually, over time, more parts of the brain are damaged. As this happens, more symptoms develop. They also become more severe.

Gum disease is caused by specific types of bacteria that coat teeth and cause gums to bleed. The coating is called a "biofilm". Research demonstrates a cause and effect relationship between gum disease and worsening memory as dental treatment for gum disease in Alzheimer's disease patients appears to improve memory. However, the relevance of this observation remains to be fully investigated.

A novel concept in which, bacterial infections of the brain have resulted in the cause of Alzheimer's disease is being suggested. This hypothesis proposes the 'plaques' of Alzheimer's disease as a biofilm containing multiple types of bacteria living together harmoniously. Our interest in this project comes from our expertise in the oral-infection model of Alzheimer's disease and from two recent research articles that focused on non-oral bacterial biofilm found within the plaques. Since bacteria responsible for causing gum disease are found in late-onset Alzheimer's disease brains; there is a high possibility that they are likely to be found in the plaque biofilm as well. We propose to explore this novel concept further to identify specific oral bacteria and their contribution to AD plaques in archival tissue specimens from Syphilis with Alzheimer's disease diagnosis cases, as this disease is caused by bacteria from the same 'family'.