

# Chronic inflammation in the brain leads the way to Alzheimer's disease

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Research published today in Biomed Central's open access journal *Journal of Neuroinflammation* suggests that chronic inflammation can predispose the brain to develop Alzheimer's disease.

To date it has been difficult to pin down the role of inflammation in Alzheimer's disease (AD), especially because trials of NSAIDs appeared to have conflicting results. Although the ADAPT (The Alzheimer's Disease Anti-inflammatory Prevention Trial) trial was stopped early, recent results suggest that NSAIDs can help people with early stages of AD but that prolonged treatment is necessary to see benefit.

Researchers from the University of Zurich, in collaboration with colleagues from the ETH Zurich and University of Bern investigated what impact immune system challenges (similar to having a severe viral infection) would have on the development of AD in mice. Results showed that a single infection before birth (during late gestation) was enough to induce long-term [neurological changes](#) and significant memory problems at old age.

These mice had a persistent increase in [inflammatory cytokines](#), increased levels of amyloid [precursor protein](#) (APP), and altered cellular localization of Tau. If this immune system challenge was repeated during adulthood the effect was strongly exacerbated, resulting in changes similar to those seen for pathological aging.

Dr Irene Knuesel who led this research explained, "The AD-like changes

within the brain of these mice occurred without an increase in amyloid  $\beta$  ( $A\beta$ ). However, in mice genetically modified to produce the human version of  $A\beta$ , the viral-like challenge drastically increased the amount of  $A\beta$  at precisely the sites of inflammation-induced APP deposits. Based on the similarity between these APP/ $A\beta$  aggregates in mice and those found in human AD, it seems likely that [chronic inflammation](#) due to infection could be an early event in the development of AD.

**More information:** Systemic immune challenges trigger and drive Alzheimer-like neuropathology in mice, Dimitrije Krstic, Amrita Madhusudan, Jana Doehner, Prisca Vogel, Tina Notter, Claudine Imhof, Abigail Manalastas, Martina Hilfiker, Sandra Pfister, Cornelia Schwerdel, Carsten Riether, Urs Meyer and Irene Knuesel, *Journal of Neuroinflammation* (in press)

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