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Amyloid betaβ (Aβ) is the major component of senile plaques (SP) in the brains of Alzheimer's disease (AD) patients, and serves as an inflammatory stimulus for microglia. Trans-caryophyllene (TC), a major component in the essential oils derived from various species of medicinal plants, has displayed neuroprotection in previous studies. However, whether TC has a protective role in AD remains unknown.

In a study, the effects of TC on Aβ1-42-induced neuroinflammation were investigated. They found that TC reduced the release of LDH in BV-2 microglial cells treated with Aβ1-42. In addition, pretreatment of BV2 microglia with TC at concentrations of 10, 25, and 50μM prior to Aβ stimulation led to significant inhibition of nitric oxide (NO) and prostaglandin E2 (PGE2) production, expression of inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2), and secretion of pro-inflammatory cytokines. Notably, our results indicate that TC remarkably attenuated Aβ1-42-activated overexpression of toll-like receptor 4 (TLR4). We further demonstrated that TC markedly reversed Aβ1-42-induced phosphorylation and degradation of IκBα, nuclear translocation of p65, and NF-κB transcriptional activity. These findings suggest that TC may have therapeutic potential for the treatment of AD [1].

1)
Hu Y, Zeng Z, Wang B, Guo S. Trans-caryophyllene inhibits amyloid β (Aβ) oligomer-induced neuroinflammation in BV-2 microglial cells. Int Immunopharmacol. 2017 Aug 15;51:91-98. doi: 10.1016/j.intimp.2017.07.009. [Epub ahead of print] PubMed PMID: 28821008.