# Lipopolysaccharide

Systemic organ dysfunction is one of the important issues for the patients with Alzheimer's disease (AD) and their caregivers. Recent evidences suggest that periodontitis is a possible risk factor for progression of AD and lipopolysaccharide derived from Porphyromonas gingivalis (Pg-LPS) which is a major periodontopathic bacteria induces cognitive impairment in mice [1].

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Lipopolysaccharide (LPS) administration before controlled cortical impact can contribute to neuroprotection. However, the underlying mechanisms and whether LPS preconditioning confers neuroprotection against closed head injury remains unclear.

Turner et al., hypothesized that preconditioning with a low dose of LPS (0.2 mg/kg) would regulate glial reactivity and protect against diffuse axonal injury induced by weight drop. LPS was administered 7 days prior to TBI. LPS administration reduced locomotion, which recovered completely by time of injury.

LPS preconditioning significantly reduced the post-injury gliosis response near the corpus callosum, possibly by downregulating the oncostatin M receptor. These novel findings demonstrate a protective role of LPS preconditioning against diffuse axonal injury. LPS preconditioning successfully prevented neurodegeneration near the corpus callosum, as measured by fluorojade B.

Further work is required to elucidate whether LPS preconditioning confers long-term protection against behavioral deficits and to elucidate the biochemical mechanisms responsible for LPS-induced neuroprotective effects [2].

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Hayashi K, Hasegawa Y, Takemoto Y, Cao C, Takeya H, Komohara Y, Mukasa A, Kim-Mitsuyama S. Continuous intracerebroventricular injection of Porphyromonas gingivalis lipopolysaccharide induces systemic organ dysfunction in a mouse model of Alzheimer's disease. Exp Gerontol. 2019 Feb 17. pii: S0531-5565(18)30570-9. doi: 10.1016/j.exger.2019.02.007. [Epub ahead of print] PubMed PMID: 30786259.
2)
Turner RC, Naser ZJ, Lucke-Wold BP, Logsdon AF, Vangilder RL, Matsumoto RR, Huber JD, Rosen CL. Single low-dose lipopolysaccharide preconditioning: neuroprotective against axonal injury and modulates glial cells. Neuroimmunol Neuroinflamm. 2017 Jan;4:6-15. doi: 10.20517/2347-8659.2016.40. PubMed PMID: 28164149.