

#MS11060

LPS-PG



Lipopolysaccharide from *Porphyromonas gingivalis* - TLR2 & TLR4 ligand

- ☒ 1mg
- ☒ 5mg

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DESCRIPTION

LPS-PG is a standard preparation of lipopolysaccharide (LPS) from the Gram-negative bacteria *Porphyromonas gingivalis*. LPS is the principal component of Gram negative bacteria that activates the innate immune system. LPS recognition is predominantly mediated by TLR4. LPS-PG is an important virulence factor in the mechanisms of periodontal disease. LPS-PG presents a unique and heterogenous chemical structure, which differs from traditionally recognized enteric bacterium-derived LPS. The fact that LPS-PG exhibits activity in C3H/HeJ mice, which are deficient for TLR4, led to a common belief that this LPS is a TLR2 ligand^{2,3}. However, structural and functional studies of LPS-PG have revealed that it activates cells through TLR4. The TLR2 activity of LPS-PG is ascribed to a contaminant lipoprotein⁴. The TLR response to LPS-PG is dependent on the presence of key accessory molecules: CD14 is required for both TLR2 and TLR4 activation while MD-2 is only necessary for TLR4 activation⁵.

1. Poltorak A. et al., 1998. Defective LPS signaling in C3H/HeJ and C57BL/10ScCr mice: mutations in Tlr4 gene. *Science*, 282:2085-8.
2. Kirikae T. et al., 1999. Lipopolysaccharides (LPS) of oral black-pigmented bacteria induce tumor necrosis factor production by LPS-refractory C3H/HeJ macrophages in a way different from that of *Salmonella* LPS. *Infect Immun.* 67(4):1736-42.
3. Hirschfeld M. et al., 2001. Signaling by toll-like receptor 2 and 4 agonists results in differential gene expression in murine macrophages. *Infect Immun.* 69(3):1477-82.
4. Ogawa T. et al., 2007. Chemical structure and immunobiological activity of *Porphyromonas gingivalis* lipid A. *Front Biosci.* 12:3795-812.
5. Darveau RP. et al., 2004. *Porphyromonas gingivalis* lipopolysaccharide contains multiple lipid A species that functionally interact with both toll-like receptors 2 and 4. *Infect Immun.* 72(9):5041-51.

Storage

- LPS-PG is provided lyophilized and shipped at room temperature. Store at -20°C.
- Upon resuspension, prepare aliquots of LPS-PG and store at 4°C for short term storage or -20°C for long storage. Resuspended product is stable for 1 month at 4°C and for 6 months at -20°C when properly stored.

Quality control

- The TLR4 activity is controlled using HEK-Blue™ TLR4 cells.
- The presence of other bacterial components (e.g. lipoproteins) is controlled using HEK-Blue™ TLR2 cells.

METHODS

Preparation of stock solution (1 mg/ml)

- Add 1 ml of endotoxin-free water (provided) and homogenize.
- Prepare aliquots of stock solution and store at 4°C for 1 month or at -20°C for 6 months. Further dilutions can be prepared using water.

Working concentrations:

- TLR4 activity: 100 ng - 10 µg/ml
- TLR2 activity: 10 ng/ml - 10 mg/ml

TLR2 & TLR4 activation using LPS-PG

- Dispense 20 µl of LPS-PG at various concentrations (10 ng - 10 µg/ml) per well of a 96-well plate.
- Prepare a OverExpress-TLR cell suspension and immediately add 180 µl of the cell suspension to each LPS-PG-containing well.
- Incubate the plate for 6 - 24 h at 37°C, 5% CO₂.
- Determine the marker gene.

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