

LPS-PG

Standard lipopolysaccharide from *Porphyromonas gingivalis*; TLR2 and TLR4 ligand

Catalog code: tlr1-pglps

<https://www.invivogen.com/lps-pg>

For research use only

Version 23G12-MM

PRODUCT INFORMATION

Contents

- 1 mg lipopolysaccharide from *Porphyromonas gingivalis* (LPS-PG)
- 1.5 ml endotoxin-free water

Storage and stability

- LPS-PG is shipped at room temperature. Upon receipt, store product at -20°C.
- Upon resuspension, prepare aliquots and store at -20°C. Resuspended product is stable for 6 months when properly stored. Avoid repeated freeze-thaw cycles.

Quality control

- Activation of TLR4 has been confirmed using HEK-Blue™ TLR4 cells.
- The presence of other bacterial components (e.g. lipoproteins) has been assessed using HEK-Blue™ TLR2 cells.

DESCRIPTION

LPS-PG is a semi-rough (sr)-form of lipopolysaccharide (LPS) from the Gram-negative bacteria *Porphyromonas gingivalis*. LPS-PG is an important virulence factor in the mechanisms of periodontal disease. LPS is the principal component of Gram-negative bacteria that activates the innate immune system.

LPS recognition is predominantly mediated by TLR4¹. The TLR4 response to LPS-PG is dependent on the presence of key accessory molecules, CD14 and MD2². 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^{3,4}. 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 lipoprotein⁵. LPS-PG is a standard LPS preparation that activates TLR2 and TLR4.

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. Darveau R.P. 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. 3. 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. 4. 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. 5. Ogawa T. et al., 2007. Chemical structure and immunobiological activity of *Porphyromonas gingivalis* lipid A. *Front Biosci.* 12:3795-812.

PRODUCT PROPERTIES

Species: *Porphyromonas gingivalis*

Specificity: TLR2 and TLR4 agonist

Solubility: 1 mg/ml in water

Working concentrations:

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

METHODS

Preparation of stock solution (1 mg/ml)

- Add 1 ml of endotoxin-free water (provided) and homogenize.

Note: LPS-PG stock solution may appear cloudy.

TLR4 activation using LPS-PG

LPS-PG can be used to activate TLR4 in HEK-Blue™ TLR4 cells, that were designed to study TLR4 stimulation by monitoring NF-κB activation. Stimulation of HEK-Blue™ TLR4 cells with a TLR4 agonist activates NF-κB which induces the production of SEAP (secreted embryonic alkaline phosphatase). Levels of SEAP can be easily determined using HEK-Blue™ Detection, a cell culture medium that allows the detection of SEAP as the reporter protein is secreted by the cells.

For more information visit: <https://www.invivogen.com/hek-blue-tlr4>.

- Add 20 µl of LPS-PG at various concentrations (100 ng-10 µg/ml) in a well of a 96-well plate.
- Prepare a cell suspension ~140,000 cells per ml in HEK-Blue™ Detection.
- Add 180 µl of the cell suspension (~25,000 cells) to each LPS-PG-containing well.
- Incubate the plate for 6-24 h at 37°C, 5% CO₂.
- Determine SEAP levels using a spectrophotometer at 620-655 nm.

RELATED PRODUCTS

Product	Description	Cat. Code
HEK-Blue™ Detection	SEAP Detection reagent	hb-det2
HEK-Blue™ hTLR4 Cells	Human TLR4 reporter cells	hkb-htlr4
HEK-Blue™ mTLR4 Cells	Murine TLR4 reporter cells	hkb-mtlr4
LPS-EB Ultrapure	LPS from <i>E. coli</i> O111:B4	tlrl-3pelps
MPLA-SM*	MPLA from <i>S. minnesota</i>	tlrl-mpla2
MPLAS	Synthetic MPLA	tlrl-mpls

TECHNICAL SUPPORT

InvivoGen USA (Toll-Free): 888-457-5873

InvivoGen USA (International): +1 (858) 457-5873

InvivoGen Europe: +33 (0) 5-62-71-69-39

InvivoGen Asia: +852 3622-3480

E-mail: info@invivogen.com