

LPS-EB VacciGrade™

Lipopolysaccharide from *E. coli* 0111:B4 strain; TLR4-based adjuvant

Catalog code: vac-3pelps

<https://www.invivogen.com/lpseb-vaccigrade>

For research use only. Not for use in humans.

Version 25A02-MM

PRODUCT INFORMATION

Contents

- 5 x 10⁶ EU of VacciGrade™ lipopolysaccharide from *E. coli* 0111:B4 (LPS-EB VacciGrade™)

Note: LPS-EB VacciGrade™ is sterile filtered prior to lyophilization.

- 10 ml sterile endotoxin-free physiological water (NaCl 0.9%)

Storage and stability

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

Quality control

- LPS-EB VacciGrade™ is a preclinical grade preparation of lipopolysaccharide (LPS) from *E. coli* 0111:B4 strain. It is prepared under strict aseptic conditions. LPS-EB VacciGrade™ is guaranteed sterile.
- The presence of other bacterial components (e.g. peptidoglycans and lipoproteins) has been assessed using HEK-Blue™ TLR2 cells.
- The endotoxin level has been measured using a chromogenic LAL assay and the TLR4 activity has been tested using HEK-Blue™ TLR4 cells.

DESCRIPTION

Lipopolysaccharide (LPS) is a natural adjuvant synthesized by Gram-negative bacteria and is a potent activator of the immune system. LPS stimulates the immune response through Toll-like receptor 4 (TLR4)¹. This recognition involves the binding of LPS with lipopolysaccharide-binding protein (LBP) and subsequently with CD14 which physically associates with a complex including TLR4 and MD2². Formation of the TLR4-centered LPS receptor complex induces the production of proinflammatory cytokines, such as IL-12 and TNF- α , through the MyD88 pathway. LPS signaling also involves a MyD88-independent cascade that mediates the expression of IFN-inducible genes.

Similar to other TLR-based adjuvants, LPS drives Th1 immunity^{3,4}, although in certain circumstances low-dose inhaled LPS can promote Th2 responses⁵. While LPS is a potent adjuvant, its pyrogenic activity has prevented clinical use of LPS in vaccines. Large quantities of LPS induce the overproduction of cytokines causing septic shock¹.

Intramuscular injection with LPS-EB induced the secretion of the proinflammatory cytokines TNF- α and IL-6 and the Th1-type cytokines, IFN- γ and IL-12⁶. Cellular assays confirmed that LPS-EB is a potent inducer of dendritic cells activation and maturation via a TLR4 signaling pathway⁶.

Most LPS preparations on the market are contaminated by other bacterial components, such as lipoproteins, thus activating TLR2 signaling as well as TLR4 signaling. LPS-EB VacciGrade™ only activates the TLR4 pathway.

1. Poltorak A. et al., 1998. Defective LPS signaling in C3H/HeJ and C57BL/10ScCr mice: mutations in Tlr4 gene. *Science*, 282(5396): 2085-8. **2. Shimazu R. et al., 1999.** MD-2, a molecule that confers lipopolysaccharide responsiveness on Toll-like receptor 4. *J Exp Med*, 189(11):1777-82. **3. Jamalan M. et al., 2011.** Effectiveness of *Brucella abortus* lipopolysaccharide as an adjuvant for tuberculin PPD. *Biologicals; journal of the International Association of Biological Standardization*, 39(1): 23-28. **4. Barton G.M. & Medzhitov R., 2002.** Control of adaptive immune responses by Toll-like receptors. *Curr. Opin. Immunol.* 14:380. **5. Iwasaki A. & Medzhitov R., 2004.** Toll-like receptor control of the adaptive immune responses. *Nat Immunol.* 5(10):987-95. **6. Han J. et al., 2014.** Characterization of the structure and immunostimulatory activity of a vaccine adjuvant, de-o-acylated lipooligosaccharide. *PLoS One*, 22;9(1):e85838.

METHODS

Preparation of sterile stock solution (5 x 10⁶ EU/ml)

1. Add 1 ml of sterile endotoxin-free physiological water (provided).
2. Vortex until complete solubilization.
3. Use immediately or prepare aliquots and store at -20°C.

Note: 5 x 10⁶ EU/ml corresponds to 5 mg/ml.

Working Concentration: 0.1-25 μ g/mouse

RELATED PRODUCTS

Product	Cat. Code
AddaVax™	vac-adx-10
Adju-Phos® adjuvant	vac-phos-250
Alhydrogel® adjuvant 2%	vac-alu-250
CFA	vac-cfa-10
IFA	vac-ifa-10
ODN 1826 VacciGrade™	vac-1826-1
ODN 2006 VacciGrade™	vac-2006-1
OVA EndoFit™ (ovalbumin for <i>in vivo</i> use)	vac-pova
MPLA-SM VacciGrade™	vac-mpla
MPLAs VacciGrade™	vac-mpls

For a complete list of adjuvants provided by InvivoGen, please visit www.invivogen.com/vaccine-adjuvants.

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 3622-34-80

E-mail: info@invivogen.com

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