

LPS-EB VacciGrade™

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

Catalog # vac-3pelps

For research use only. Not for use in humans.

Version # 14E06-MM

PRODUCT INFORMATION

Content

- 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 provided lyophilized and shipped at room temperature. Store at -20°C. Product is stable 1 year when properly stored.

- Upon resuspension, prepare aliquots of LPS-EB VacciGrade™ and store at -20°C. Resuspended product is stable 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 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.

METHODS

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

- Add 1 ml of sterile endotoxin-free physiological water (provided).

- Vortex until complete solubilization.

- 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 µg/mouse

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. Jamal 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.

TECHNICAL SUPPORT

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RELATED PRODUCTS

Product	Description	Catalog Code
Adjuvants		
2'3'-cGAMP Vaccigrade™	STING agonist	vac-nacga23
3'3'-cGAMP Vaccigrade™	STING agonist	vac-nacga
AddaVax™	Squalene-Oil-in-water	vac-adx-10
Alhydrogel® adjuvant 2%	Aluminium hydroxide gel	vac-alu-250
c-di-AMP Vaccigrade™	STING agonist	vac-nacda
c-di-GMP Vaccigrade™	STING agonist	vac-nacdg
Flagellin FliC Vaccigrade™	TLR5 agonist	vac-fla
Gardiquimod Vaccigrade™	TLR7 agonist	vac-gdq
IFA	Incomplete Freund's adjuvant	vac-ifa-10
Imiquimod Vaccigrade™	TLR7 agonist	vac-imq
MPLAs Vaccigrade™ (Synthetic MPLA)	TLR4 agonist	vac-mpls
MPLA-SM Vaccigrade™ (MPLA from <i>S. minnesota</i> R595)	TLR4 agonist	vac-mpla
N-glycolyl-MDP Vaccigrade™	NOD2 agonist	vac-gmdp
ODN 1585 Vaccigrade™	Murine TLR9 agonist	vac-1585-1
ODN 1826 Vaccigrade™	Murine TLR9 agonist	vac-1826-1
ODN 2395 Vaccigrade™	Human/murine TLR9 agonist	vac-2395-1
ODN 2006 Vaccigrade™	Human TLR9 agonist	vac-2006-1
Pam3CSK4 Vaccigrade™	TLR2 agonist	vac-pms
Poly(I:C) Vaccigrade™	TLR3 agonist	vac-pic
R848 Vaccigrade™	TLR7/8 agonist	vac-r848
TDB Vaccigrade™	Mincle agonist	vac-tdb
OVA Antigens		
EndoFit™ Ovalbumin	For <i>in vivo</i> use; endotoxin level <1EU/mg	vac-pova
Ovalbumin	For detection; Western, ELISA	vac-stova
Ova 257-264	For detection; ELISPOT	vac-sin
Ova 323-339	For detection; ELISPOT	vac-isq

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