Product Data Sheet

Product Name: Lipoteichoic acid
Cat. No.: GF10303

Chemical Properties

Cas. No.	56411-57-5	
Formula	M.Wt	
Solubility	Storage	Store at 2-8°C,protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.	
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.	
Structure	Lipoteichoic acid	

Protocol

Cell experiment [1]:

Cell lines	Peritoneal macrophages of mice
Preparation Method	Mouse peritoneal macrophages were collected, and Lipoteichoic acid (50μg/mL) was added to activate the macrophages for 5min. The culture was then washed with PBS (pH 7.4) to remove free Lipoteichoic acid. Afterward, 100μL of DMEM was added, and the cells were cultured for another 48h. The culture medium was then collected for cytotoxicity assays on L-929 cells.
Reaction Conditions	50μg/mL; 5min

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Applications	Lipoteichoic acid treatment significantly activated macrophages, and the released cytokines led to a 51.32% mortality rate in L-929 cells.
Animal experiment [1]:	
Animal models	BALB/c mice
Preparation Method	Lipoteichoic acid (20mg/kg, i.v.) was injected into the conscious mice to cause sepsis and were treated with saline at once. Blood samples were taken by extirpating eyeballs at 24h after Lipoteichoic acid injection. After that, the chest cavity of the animal was opened and the right lung was ligated and excised. The lung lobes were submerged in 10% formaldehyde for histopathological staining with hematoxylin-eosin and examination. BAL fluid of the left lung was collected. The inflammatory cytokines IL-1β, TNF-α in serum and BAL fluid were determined by ELISA using specific kits. Microscopic evaluation was performed to characterize the inflammatory injury of the organs.
Dosage form	20mg/kg; i.v.
Applications	Lipoteichoic acid treatment led to lung congestion, neutrophil infiltration, alveolar wall thickening, and significantly increased the levels of IL-1β and TNF-α in serum and BAL fluid.

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References:
[1] JIAO Y, WU M P. Apolipoprotein AI diminishes acute lung injury and sepsis in mice induced by lipoteichoic acid[J]. Cytokine, 2008, 43(1): 83-87.

Background

Lipoteichoic acid is a teichoic acid predominantly located in the cell walls of Gram-positive bacteria, widely involved in stimulating immune responses and cellular signaling pathways[1]. Lipoteichoic acid plays a key role in regulating cell growth, division, and host immune recognition, and is commonly applied in the rapid diagnosis of pathogenic infections as well as in research on host–pathogen interactions and innate immunity[2,3,4].

In vitro, treatment of mouse peritoneal macrophages with Lipoteichoic acid (50μg/mL) for 5min, followed by removal of unbound Lipoteichoic acid and further culture for 48h, significantly activates macrophages, whose released cytokines induce 51.32% mortality in L-929 cells[5]. Stimulation of primary bovine mammary epithelial cells (bMEC) with Lipoteichoic acid (20μg/mL) for 2-4h markedly upregulates mRNA expression of IL-1β, IL-8, TNF-α, β-defensin, and CXCL6, although this induction declines to baseline by 8-16h (except for β-defensin)[6].

In vivo, two intraperitoneal injections of Lipoteichoic acid (75mg/kg; 3h apart) in pregnant C3H/HeN × $B6D2F_1$ hybrid mice on gestational day 15 result in 100% preterm

delivery, accompanied by cervical softening, placental damage, and elevated inflammatory cytokines (IL-1α, IL-6, TNF-α) in plasma and amniotic fluid[7]. A single intravenous injection of Lipoteichoic acid (20mg/kg) in BALB/c mice induces lung congestion, neutrophil infiltration, alveolar wall thickening, and significantly increases IL-1β and TNF-α levels in serum and bronchoalveolar lavage fluid[5].

References:

[1] PERCY M G, GRÜNDLING A. Lipoteichoic acid synthesis and function in gram-positive bacteria[J]. Annual review of microbiology, 2014, 68(1): 81-100.
[2] GINSBURG I. Role of lipoteichoic acid in infection and inflammation[J]. The Lancet infectious diseases, 2002, 2(3): 171-179.
[3] SEO H S, MICHALEK S M, NAHM M H. Lipoteichoic acid is important in innate immune responses to gram-positive bacteria[J]. Infection and immunity, 2008, 76(1): 206-213.
[4] PICKETT J E, THOMPSON J M, SADOWSKA A, et al. Molecularly specific detection of bacterial lipoteichoic acid for diagnosis of prosthetic joint infection of the bone[J]. Bone research, 2018, 6(1): 13.
[5] JIAO Y, WU M P. Apolipoprotein AI diminishes acute lung injury and sepsis in mice induced by lipoteichoic acid[J]. Cytokine, 2008, 43(1): 83-87.
[6] STRANDBERG Y, GRAY C, VUOCOLO T, et al. Lipopolysaccharide and lipoteichoic acid induce different innate immune responses in bovine mammary epithelial cells[J]. Cytokine, 2005, 31(1): 72-86.
[7] KAJIKAWA S, KAGA N, FUTAMURA Y, et al. Lipoteichoic acid induces preterm delivery in mice[J]. Journal of pharmacological and toxicological methods, 1998, 39(3): 147-154.

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