LPS (Lipopolysaccharides) from E. coli 055:B5

Cat #: BGT-CGL-05000

Size: 500mg/1g

Storage: Store at 2–8 °C, protected from light and moisture, in a tightly closed container.

Product Description

Lipopolysaccharide (LPS) from Escherichia coli O55:B5 is a major constituent of the outer membrane of Gram-negative bacteria. The molecule is composed of lipid A, core oligosaccharide, and an O-specific polysaccharide chain. This preparation is routinely used for in vitro cell activation and Limulus amebocyte lysate (LAL)-based endotoxin assays.

E. coli is a Gram-negative bacillus commonly found in the intestinal tract of humans and animals. Based on the O-antigen, E. coli can be classified into multiple serotypes; O55:B5 is among the most prevalent. Fermentation of this serotype yields LPS containing the O55-specific chain.

LPS is anchored in the bacterial outer membrane, where it is essential for growth, structural integrity, and protection against host defenses. As an endotoxin, LPS is a potent trigger of host immune responses. Consequently, O55:B5 LPS is widely employed in biomedical research to study infection, inflammation, and innate immunity. It stimulates mammalian immune cells to release pro-inflammatory cytokines, thereby mimicking bacterial infection and facilitating drug discovery for inflammatory disorders. Additionally, LPS serves as a vaccine adjuvant to enhance immunogenicity and is used as an endotoxin standard in food- and water-quality testing.

Our LPS is produced under controlled fermentation conditions using E. coli O55:B5 as the starting strain. After cultivation, cells are harvested, disrupted, and subjected to hot-phenol extraction followed by extensive purification. The product is lyophilized and supplied as a sterile-filterable powder suitable for a broad range of research and industrial applications.

Product Advantages

High purity: Protein < 3% ; nucleic acid < 300 ng/mg
Low endotoxin variability: ≥ 500,000 EU/mg
Broad applicability: Compatible with cell culture, animal studies, LAL tests, and vaccine development

Specifications

Parameter	Specifications
Synonyms	Endotoxin; Bacterial endotoxin
Source	*Escherichia coli* O55:B5
Purity	≥ 97 %
Appearance	Off-white to light-brown lyophilized powder
Purification	Phenol extraction
Potency	≥ 500,000 EU/mg
Solubility	≥ 5 mg/mL in water (sterile)

Reconstitution & Storage

Stock solution (1 mg/mL): Dissolve 1 mg LPS in 1 mL sterile balanced salt buffer(e.g., PBS, saline) or cell-culture medium. Vortex gently until fully dissolved. Sterilize with a 0.22 µm filter if required.

Storage:

- 2–8 °C for up to 1 month (single-use aliquots recommended).
- –20 °C for up to 2 years (avoid repeated freeze-thaw cycles).

Biological Activity

LPS is a unique component of the Gram-negative bacterial outer membrane, exposed on the cell surface of non-capsulated strains. It maintains outer-membrane integrity and shields bacteria from bile salts and lipophilic antibiotics. Structurally, LPS comprises lipid A (responsible for endotoxic activity), core oligosaccharide, and the O-polysaccharide chain that defines the bacterial serotype.

LPS elicits a cascade of immune activation leading to pathophysiological events such as septic shock and vascular collapse. Clinically, LPS detection aids the diagnosis of meningitis. In research, LPS is used to study structure, metabolism, immunology, physiology, toxicity, and biosynthetic pathways. It induces cytokine synthesis (e.g., interleukins), and serves in animal models of inflammation and acute lung injury.

Notes

1. **Vessel choice:** Use siliconized or low-binding plastic/glass when LPS concentration is < 0.1 mg/mL to minimize adsorption. Adsorption is negligible at ≥ 1 mg/mL.
2. **Concentration optimization:** LPS activity is dose-dependent; excessive concentrations can be cytotoxic. Titrate according to cell type and experimental goal.
3. **Sterility:** Product is **not sterile**. Prepare solutions in sterile buffer and filter-sterilize (0.22 μm) if required.
4. **Handling:** Avoid degradation and contamination. Prepared solutions should be used promptly or stored at 2–8 °C for short-term use.
5. **Safety:** LPS may induce cytotoxicity or allergic reactions. Monitor cells or animals for adverse effects