Monophosphoryl Lipid A (synthetic) (Ready-to-Use)

TLR4 activator

Lipopolysaccharides (LPS), which constitute the major components on the cell surface of Gram-negative bacteria, have been proved to be particularly endotoxic and cause septicemia. It has been further demonstrated that the LPS anchor part, namely, lipid A, is primarily responsible for the endotoxicity of LPS. Lipid A binds to Toll-like receptor 4 (TLR4) to activate a cascade of immunological responses, including the production of a number of cytokines and chemokines such as tumor necrosis factor-α (TNF-α), interleukin-1β (IL-1β), IL-6, and interferon-β (IFN-β). Thus, lipid A has become a valuable molecular template in the discovery of new immunostimulants, for example vaccine adjuvant, and in the design and development of novel conjugate vaccines.
Lipid A is a highly hydrophobic glycolipid, consisting of a β1,6-linked di-glucosamine with two phosphate or pyrophosphate groups and 4–8 long lipid chains attached to the 1,4'-O-and 2,2'-N-3,3'-O-positions, respectively. The structures of lipid A derived from different bacteria can vary significantly in terms of the number, structures and locations of their lipids. In order to understand and eventually mitigate the endotoxicity of lipid A for the development of useful immunostimulant, numerous lipid A derivatives have been designed, synthesized, and biologically assayed. The structure-activity relationship studies of natural lipid A and various synthetic analogs have shown that both the number and lengths of acyl chains and the phosphorylation state of lipid A have a significant impact on its endotoxicity. It appears that the diphosphorylated hexa-acyl form of lipid A, such as *Escherichia coli* Lipid A, is optimally recognized by TLR4 to exhibit the full spectrum of endotoxicity. Most importantly, it was observed that the endotoxic activity of Lipid A could be significantly reduced after the removal of its anomeric phosphate group, Monophosphoryl Lipid A (MPL-A) while its immunostimulatory property remained unaffected.

Citations: 8 View Online »

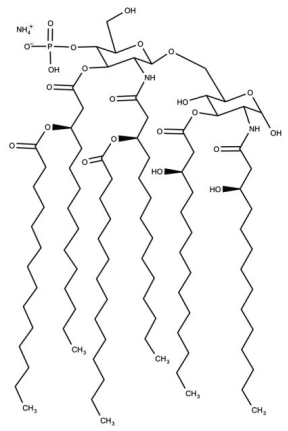
Ordering Information

Order Online »

ALX-581-205-C100	100µg

Manuals, SDS & CofA

View Online »


OH
NH4+
O
O−
P
O
OH
NH
HO
O
NH
OH
HO
HO
CH3
CH3
CH3
CH3
CH3

Handling & Storage

Use/Stability	As indicated on product label or CoA when stored as recommended.
Handling	Keep sterile.
Long Term Storage	+4°C
Shipping	Ambient Temperature

Regulatory Status

RUO - Research Use Only

Product Details

Activity	Activates Toll-like receptor 4 (TLR4) about 10-fold less (100ng/ml) compared to the endotoxic lipid A molecule.Synthetic lipid A does not activate TLR2 as determined with splenocytes and macrophages from TLR4 deficient mice. Exhibits reduced endotoxic and pyrogenic activity compared to lipid A and LPS.
Alternative Name	MPL-A, Glucopyranosyl lipid adjuvant, GLA
CAS	1246298-63-4
Couple Target	TLR, TLR4
Couple Type	Activator, Ligand
Formula	$C_{96}H_{184}N_3O_{22}P$
Formulation	Liquid. Sterile, *ready-to-use* solution in pyrogen free double distilled water.
MW	1763.47
Source	Synthetic.

Last modified: May 29, 2024

ENZO LIFE SCIENCES, INC.
Phone: 800.942.0430
info-usa@enzolifesciences.com

European Sales Office
ENZO LIFE SCIENCES (ELS) AG
Phone: +41 61 926 8989
info-eu@enzolifesciences.com

Belgium, The Netherlands & Luxembourg
Phone: +32 3 466 0420
info-be@enzolifesciences.com

France
Phone: +33 472 440 655
info-fr@enzolifesciences.com

Germany
Phone: +49 7621 5500 526
info-de@enzolifesciences.com

UK & Ireland
Phone (UK customers): 0845 601 1488
Phone: +44 1392 825900
info-uk@enzolifesciences.com