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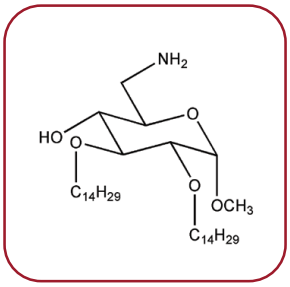

PRODUCT DATA SHEET

IAXO-102 (CD14/TLR4 Antagonist) (synthetic)

Cat. No.: IAX-600-002 **Lot. No.:**

Name	Methyl 6-Deoxy-6-amino-2,3-di-O-tetradecyl-α-D-glucopyranoside
Synonyms	Small molecule CD14/TLR4 ligand/modulator. Glycolipid. Lipid A analogue.
Formula	$C_{35}H_{71}NO_5$
MW	585.94 g/mol (iodide salt)
CAS Number	1115270-63-7
Purity	≥98% according to TLC, NMR, MS analysis
Appearance	White solid
Solubility	Soluble in Methanol, DMSO and Ethanol 1:1 (vol:vol): >10mM
Handling	Reconstitution: For a 2mM stock solution, dissolve total vial content in 853µl (1mg size) in DMSO/Ethanol (1:1) (vol:vol).
Activity	Described to interfere with human, rat and mouse TLR4/CD14 signaling, other species not tested. Optimal working concentration depends upon the type, purity and concentration and of TLR4 ligand, carrier protein such as LPS-binding protein (LBP), soluble and membrane-bound CD14, the presence of TLR4 co-receptors (e.g. CD36) as well on type and time of read-out (e.g. cytokine measurement in cell culture supernatant) or the biological outcome of *in vivo* experiments and therefore needs to be determined for each application. Recommended starting concentration: *in vitro*: 5µM, *in vivo* (rodent): 3mg/kg.
Shipping	Ambient
Storage	2-8°C
Stability	12 months after receipt (unopened and as supplied)
MSDS	Available on request

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Product Information

- The novel IAXO classes of glycolipid and benzylammonium lipids are synthetic TLR4/CD14 ligands with TLR4 modulating activities in vitro, and conferring protection against TLR4/CD14-mediated tissue damage and inflammation in vivo.
- As research tools IAXOs are useful to explore CD14-dependent and TLR4-independent pathways and TLR4 activation by endogenous ligands (e.g. hyaluronic acid oligosaccharides, oxLDL, HMGB1) in sterile inflammation. In pre-clinical models IAXO compounds have been shown to inhibit neuropathic pain; secondary necrosis of acute drug-induced liver failure and vascular inflammation and abdominal aortic aneurysm by blocking non-hematopoietic TLR4 signaling.
- IAXO compounds hold considerable promise in pharmacological settings, where inhibition of sterile (auto-) inflammation is desired, without compromising TLR4's key role in the defense of pathogens. CD14-dependent and independent TLR4 activation in the central nervous system by endogenous factors has been recently related to a wide array of inflammatory neurological diseases such as amyotrophic lateral sclerosis and Alzheimer's disease.

Product Specific References

[1] *Investigation of TLR4 Antagonists for Prevention of Intestinal Inflammation.* Tam JSY, et al. Inflammation (2022); doi: https://doi.org/10.1007/s10753-022-01714-0

[2] *Effects of Toll-Like Receptor 4 Antagonists Against Cerebral Vasospasm After Experimental Subarachnoid Hemorrhage in Mice.* Kawakita F, et al. Mol. Neurobiol. (2017); 54:6624-6633

[3] *A novel small mimetic molecule TLR4 antagonist (IAXO-102) modulates TLR4 proinflammatory signalling and inhibits aortic aneurysms development.* Huggins C, et al. Atherosclerosis (2015); 241:1

[4] *Toll like receptor 4 antagonist prevents acetaminophen induced acute liver failure in mice: a novel therapeutic strategy.* Shah N, et al. Gut (2012); 61:A28

[5] *Cancer-Derived VEGF-C Increases Chemokine Production in Lymphatic Endothelial Cells to Promote CXCR2-Dependent Cancer Invasion and MDSC Recruitment.* Chen JY, et al. Cancers (2019); 11:1120

[6] *Structural insights into pharmacophore-assisted in silico identification of protein-protein interaction inhibitors for inhibition of human toll-like receptor 4 - myeloid differentiation factor-2 (hTLR4-MD-2) complex.* Mishra V, Pathak C. J. Biomol. Struct Dyn. (2019); 37:196

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General Information

- Persistent inflammation has been implicated in the pathogenesis not only of diverse chronic diseases such as neuropathic pain, atherosclerosis, chronic hepatitis, and abdominal aortic aneurysm, but also acute organ failure, cardiac infarct and stroke.
- The Toll-like receptor (TLR) family members are key contributors to these pro-inflammatory conditions. These pattern recognition receptors respond to molecular patterns in components of bacteria and viruses. In addition to their role in detecting pathogen associated molecular patterns (PAMPs), TLRs can also sense endogenous danger (or tissue damage) associated molecular patterns (DAMPs) and have been implicated in perpetuating inflammatory cascades in the absence of invading microbes or other pathogens.
- TLR4's well-known key role in orchestrating innate and adaptive immune response to Gram-negative bacteria now extends into the area of mediating auto-inflammation and tissue repair and remodelling.

References

[1] *Glycolipids and benzylammonium lipids as novel antisepsis agents: synthesis and biological characterization.* Piazza M, et al. J. Med. Chem. (2009); 52:1209

[2] *TLR4 receptor as new target to treat neuropathic pain: efficacy of a new receptor antagonist in a model of peripheral nerve injury in mice.* Bettoni I, et al. Glia (2008); 56:1312

[3] *Inhibition of lipid a stimulated activation of human dendritic cells and macrophages by amino and hydroxylamino monosaccharides.* Peri F, et al. Angew. Chem. (2007); 46:3308

[4] *Evidence of a specific interaction between new synthetic antisepsis agents and CD14.* Piazza M, et al. Biochemistry (2009); 48:12337

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[6] *Exploring the LPS/TLR4 signal pathway with small molecules.* Peri F, et al. Biochem. Soc. Trans. (2010); 38:1390

[7] *Multivalent glycoconjugates as anti-pathogenic agents.* Bernardi A, et al. Chem. Soc. Rev. (2013); 42:4709

[8] *Toll-like receptor 4 (TLR4) modulation by synthetic and natural compounds: an update.* Peri F, Calabrese V. Med. Chem. (2014); 57:3612

[9] *TLR4 Signaling Pathway Modulators as Potential Therapeutics in Inflammation and Sepsis.* Kuzmich NN, et al. Vaccines (2017); 5:34

[10] *Increasing the Chemical Variety of Small-Molecule-Based TLR4 Modulators: An Overview.* Romerio A and Peri F. Front. Immunol. (2020); 11:1210

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