



**PRODUCT DATA SHEET**

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**Trehalose 6,6'-dimycolate [Cord Factor] Endotoxin-free (sterile)**

**Cat. No.:** IAX-200-101

**Lot. No.:**

<b>Name</b>	Cord Factor, TDM
<b>Synonyms</b>	Isolated from <i>Mycobacterium tuberculosis</i>
<b>Formulation</b>	Lyophilised. Sterile.
<b>CAS Number</b>	61512-20-7
<b>Purity</b>	Single spot (TLC)
<b>Endotoxin-free</b>	0.002 EU/µg
<b>Solubility</b>	Soluble (5mg/ml) in chloroform:methanol:water (vol:vol) 90:9:1, hexane or isopropanol
<b>Handling/ Activity</b>	Keep sterile. To stimulate mouse bone marrow-derived macrophages, Cord Factor was suspended at a concentration of 0.2mg/ml in hexane. Of the resulting solution 1 or 10µg/well were layered in 96-well tissue culture plates and the solvent completely evaporated. Control wells were layered with solvent without Cord Factor and also incubated at 37°C. To this layer of Cord Factor, bone marrow-derived macrophages were added in 100µl of medium and incubated at 37°C for 24 hours before activation e.g. TNF-α production was measured in the supernatant. <i>In vivo</i> pulmonary granuloma formation in mice can be induced by 10µg Cord Factor per mouse applied i.v. in a water/oil/water emulsion.
<b>Shipping</b>	Ambient
<b>Storage</b>	2-8°C. Do not freeze.
<b>Stability</b>	2 years after receipt (unopened and as supplied)
<b>MSDS</b>	Available on request

**Document No.:** IAX-200-101 | **Version:** 1.4 | **Issue Date:** 23/01/2023

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#### Product Description

- The mycobacterial glycolipid trehalose-6,6'-dimycolate (TDM), also named Cord Factor (CF), is an important regulator of immune responses during
- Mycobacterium tuberculosis (Mtb) infections. Macrophages recognize TDM through the Mincle receptor and initiate TDM-induced inflammatory responses, leading to lung granuloma formation. controlled use of its cell wall activates macrophages in ways that can be harnessed for therapy.
- For example, M. bovis Bacille Calmette-Guérin (BCG) is one of the most widely used antitumor adjuvant therapies in humans. Freund's adjuvant, an emulsion of mycobacterial cell wall components in paraffin oil, is mixed with antigens to optimize memory T and B cell responses in mice. TDM along with a detoxified derivative of Lipid A (MPLA) and cell wall skeleton make up a formulation also known under the name of Ribi adjuvant.
- Mincle (macrophage inducible C-type lectin, Clec4e, Clec5f9) is a pivotal receptor for the mycobacterial cord factor. However, additional receptors may bind TDM independently or in cooperation with Mincle.

#### Product Specific References

- [1] *Inflammatory Properties and Adjuvant Potential of Synthetic Glycolipids Homologous to Mycolate Esters of the Cell Wall of Mycobacterium tuberculosis.* Tima HG, et al. J. Innate Immun. (2017); 9:162–180
- [2] *C-type lectin receptors Mcl and Mincle control development of multiple sclerosis-like neuroinflammation.* N'diaye M, et al. J. Clin. Invest. 2020; 130: 838–852

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#### General Information

- The persistence of tuberculosis within pulmonary granulomatous lesions is a complex phenomenon, with bacterial survival occurring in a focal region of high immune activity. In part, the survival of the organism may be linked to the ability of the surface glycolipid trehalose 6,6'-dimycolate (TDM; cord factor) to inhibit fusion events between phospholipid vesicles inside the host macrophage.
- At the same time, TDM contributes to macrophage activation and a cascade of events required for initiation and maintenance of granulomatous responses.

#### References

- [1] *The chemical structure of the cord factor of Mycobacterium tuberculosis.* Noll H, et al. *Biochim. Biophys. Acta* (1956); 20:299
- [2] *Studies of a biochemical lesion in experimental tuberculosis in mice. 8. Effect of derivatives and chemical analogues of cord factor on structure and function of mouse liver mitochondria.* Kato M, et al. *Am. Rev. Respir. Dis.* (1968); 98:668
- [3] *Granuloma formation induced in mice by chemically defined mycobacterial fractions.* Bekierkunst A, et al. *J. Bacteriol.* (1969); 100:95
- [4] *MARCO, TLR2, and CD14 are required for macrophage cytokine responses to mycobacterial trehalose dimycolate and Mycobacterium tuberculosis.* Bowdish DM, et al. *PLoS Pathog.* (2009); 5:e1000474
- [5] *Direct recognition of the mycobacterial glycolipid, trehalose dimycolate, by C-type lectin Mincle.* Ishikawa E, et al. *J. Exp. Med.* (2009); 206:2879
- [6] *Mycobacterial Trehalose 6,6'-Dimycolate-Induced M1-Type Inflammation.* Nguyen TKT, et al. *Am. J. Pathol.* (2020); 190:286
- [7] *Mycobacterial Cord Factor Reprograms the Macrophage Response to IFN-γ towards Enhanced Inflammation yet Impaired Antigen Presentation and Expression of GBP1.* Huber A, et al. *J. Immunol.* (2020); 205:1580
- [8] *Immune Recognition of Pathogen-Derived Glycolipids Through Mincle.* Miyake Y and Yamasaki S. *Adv. Exp. Med. Biol.* (2020); 1204:31

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