

Nigericin

NLRP3 inflammasome Inducer

Catalog code: tlr1-nig, tlr1-nig-5

<https://www.invivogen.com/nigericin>

For research use only

Version 21D28-MM

PRODUCT INFORMATION

Contents

- Nigericin sodium salt is available in two quantities:
 - 10 mg: tlr1-nig
 - 50 mg: tlr1-nig-5

Storage and stability

- Nigericin is shipped at room temperature. Upon receipt, store at -20°C.
- Upon resuspension, Nigericin can be stored at 4°C or at -20°C. Resuspended product is stable for 1 month at 4°C and for 1 year at -20°C when properly stored. Avoid repeated freeze-thaw cycles.

Quality control

- The biological activity has been confirmed using cellular assays.
- The absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and HEK-Blue™ TLR4 cells.

DESCRIPTION

Nigericin is a microbial toxin derived from the Gram-positive bacteria *Streptomyces hygroscopicus*. It induces the release of IL-1 β in response to the activation of the NLRP3 (also known as NALP3 or cryopyrin) inflammasome¹. The NLRP3 inflammasome is a caspase-1-activating complex comprising the NLR protein NLRP3 and the adaptor ASC required for the maturation and secretion of IL-1 β ².

Nigericin acts as a potassium ionophore. It probably activates NLRP3 through its ionophore function which allows the intracellular K⁺ efflux across the membrane³. Whether the formation of non-selective pannexin-1 pores also contributes to NLRP3 activation upon Nigericin treatment remains unclear⁴.

1. Mariathasan S. *et al.*, 2006. Cryopyrin activates the inflammasome and ATP. *Nature* 440:228-32. 2. Martinon F. & Tschopp J., 2004. Inflammatory caspases: linking an intracellular innate immune system to autoinflammatory diseases. *Cell* 117(5):561-74. 3. Muñoz-Planillo R. *et al.*, 2013. K⁺ efflux is the common trigger of NLRP3 inflammasome activation by bacterial toxins and particulate matter. *Immunity* 38(6):1142-53. 4. Pelegrin P. & Surprenant A., 2007. Pannexin-1 couples to maitotoxin- and nigericin-induced interleukin-1beta release through a dye uptake-independent pathway. *J Biol Chem*. 282(4):2386-94.

CHEMICAL PROPERTIES

CAS Number: 28643-80-3

Synonym: Antibiotic K178, Polyetherin A

Linear formula: C₄₀H₆₇NaO₁₁

Molecular weight: 746.94 g/mol

Solubility: 5 mg/ml in ethanol

METHODS

Solubilization of Nigericin (5 mg/ml)

- Prepare a 5 mg/ml (6.7 mM) Nigericin stock solution in 100% ethanol.
- Prepare further dilutions by adding the appropriate amount of endotoxin-free water.

Detection of NLRP3 inflammasome induction

Secretion of IL-1 β is an indicator of the NLRP3 inflammasome induction. The activation and release of IL-1 β requires two distinct signals: the first signal leads to the transcriptional upregulation and synthesis of pro-IL-1 β ; the second signal leads to IL-1 β maturation and secretion through the activation of NLRP3 inflammasome.

The synthesis of pro-IL-1 β can be induced by priming human monocytic THP-1 cells for 3 h with PMA (phorbol 12-myristate 13-acetate; 20-50 ng/ml) or LPS (lipopolysaccharide, 1 μ g/ml). Subsequent stimulation with 1-10 μ M of Nigericin leads to the formation of NLRP3 inflammasome resulting in IL-1 β maturation and secretion.

Secreted IL-1 β can be detected by Western blot or by ELISA. Alternatively, InvivoGen recommends the use of HEK-Blue™ IL-1 β cells, a reporter cell line that specifically detects bioactive IL-1 β . These cells express an NF- κ B and AP-1-inducible SEAP (secreted alkaline phosphatase) reporter gene. The presence of IL-1 β leads to NF- κ B and AP-1 activation and the subsequent secretion of SEAP. Levels of SEAP can be easily determined with QUANTI-Blue™ Solution, a detection reagent that turn purple/blue in the presence of alkaline phosphatase.

RELATED PRODUCTS

Product	Description	Cat. Code
Alum Hydroxide	Inflammasome inducer	tlr1-aloh
ATP	Inflammasome inducer	tlr1-atp
CPPD crystals	Inflammasome inducer	tlr1-cppd
HEK-Blue™ IL-1 β Cells	IL-1 β reporter cells	hkb-il1bv2
Hemozoin	Inflammasome inducer	tlr1-hz
LPS-EK	LPS from <i>E. coli</i> K12	tlr1-eklps
MSU crystals	Inflammasome inducer	tlr1-msu
QUANTI-Blue™ Solution	SEAP detection reagent	rep-qbs
THP1-Null2 cells	THP-1-derived monocytes	thp-nullz

TECHNICAL SUPPORT

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