

# Monosodium Urate Crystals

## NLRP3 inflammasome Inducer

Catalog # tlr1-msu

For research use only

Version # 11D13-MM

### PRODUCT INFORMATION

#### Content:

- 5 mg monosodium urate (MSU) crystals

#### Storage and stability:

- MSU crystals are shipped at room temperature. Store at 4°C for 1 year.
- Upon resuspension, MSU crystals should be stored at 4°C for 6 months or -20°C for 1 year. Avoid repeated freeze-thaw cycles.

### DESCRIPTION

Monosodium urate (MSU) or uric acid is the aetiological agent of the acute inflammatory condition gout. MSU crystals induce inflammation by triggering the production of the highly inflammatory cytokine interleukin (IL)-1 $\beta$ . Indeed, cells from the human monocytic cell line THP-1 or primary monocytes secrete IL-1 $\beta$  after stimulation with MSU crystals<sup>1</sup>. MSU-induced IL-1 $\beta$  production was recently shown to require the NLRP3 (also known as NALP3 or cryopyrin) inflammasome. 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 $\beta$ <sup>2</sup>. Involvement of the inflammasome is suggested by the finding that macrophages from mice deficient in various components of the inflammasome are defective in crystal-induced IL-1 $\beta$  induction<sup>1</sup>.

1. **Martinon F. et al., 2006.** Gout-associated uric acid crystals activate the NALP3 inflammasome. *Nature*. 440(7081):237-41.

2. **Martinon F, Tschopp J., 2004.** Inflammatory caspases: linking an intracellular innate immune system to autoinflammatory diseases. *Cell*. 117(5):561-74.

### CHEMICAL PROPERTIES

**CAS Number:** 1198-77-2

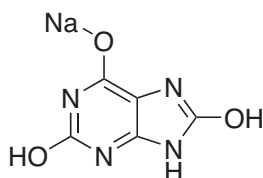
**Linear formula:** C<sub>5</sub>H<sub>3</sub>N<sub>4</sub>NaO<sub>3</sub>

**Molecular weight:** 190.1

**Structure:** Triclinic crystals characterized by X-ray diffraction

**Appearance:** White powder

**Solubility:** Not soluble



### METHODS

#### Preparation of 5 mg/ml MSU stock solution

- Add 1 ml of PBS to the 5 mg MSU vial.

*Note:* MSU is not soluble. Vortex or sonicate (for 5 minutes) prior to each use to obtain a homogenous suspension.

- Prepare further dilutions by adding the appropriate amount of PBS.

#### Detection of NLRP3 inflammasome induction

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

The synthesis of pro-IL-1 $\beta$  can be induced by priming human monocytic THP-1 cells for 3 h with PMA (phorbol 12-myristate 13-acetate; 300 ng/ml) or LPS (lipopolysaccharide, 1  $\mu$ g/ml). Subsequent stimulation with 50 - 200  $\mu$ g/ml of the MSU leads to the formation of NLRP3 inflammasome resulting in IL-1 $\beta$  maturation and secretion. Secreted IL-1 $\beta$  can be detected by Western blot or ELISA. Alternatively, InvivoGen recommends the use of HEK-Blue™ IL-1 $\beta$  cells, a reporter cell line that specifically detects bioactive IL-1 $\beta$ . These cells express an NF- $\kappa$ B and AP-1-inducible SEAP (secreted alkaline phosphatase) reporter gene. The presence of IL-1 $\beta$  leads to NF- $\kappa$ B and AP-1 activation and the subsequent secretion of SEAP. Levels of SEAP can be easily determined with HEK-Blue™ Detection or QUANTI-Blue™, detection media that turn purple/blue in the presence of alkaline phosphatase. HEK-Blue™ Detection is designed for high-throughput detection of SEAP, while QUANTI-Blue™ is more sensitive and designed for the detection and quantification of SEAP.

### RELATED PRODUCTS

Product	Catalog Code
HEK-Blue™ IL-1 $\beta$ Cells	hkb-il1b
<i>E. coli</i> K12 LPS	tlrl-eklps
Other inflammasome inducers:	
Alum crystals	tlrl-alk
ATP	tlrl-atp
CPPD crystals	tlrl-cppd
Hemozoin	tlrl-hz
Nigericin	tlrl-nig
Poly(dA:dT)	tlrl-pat

#### TECHNICAL SUPPORT

Toll free (US): 888-457-5873

Outside US: (+1) 858-457-5873

Europe: +33 562-71-69-39

E-mail: [info@invivogen.com](mailto:info@invivogen.com)

Website: [www.invivogen.com](http://www.invivogen.com)



3950 Sorrento Valley Blvd. Suite 100  
San Diego, CA 92121 - USA