

# ATP

## NLRP3 inflammasome inducer

Catalog code: tlr1-atpl

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

For research use only

Version 20K18-MM

## PRODUCT INFORMATION

### Contents

- 1 g ATP (adenosine 5'-triphosphate disodium salt) provided lyophilized

### Storage and stability

- ATP is shipped at room temperature. Store at -20°C.  
- Upon resuspension, prepare aliquots of ATP and store at -20°C. Resuspended product is stable for 6 months when properly stored.

### Quality control

- Purity: ≥99.0% (HPLC)  
- The biological activity of ATP has been confirmed using the inflammasome induction assay based on THP1-Null cells and HEK-Blue™ IL-1β cells.  
- The absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and HEK-Blue™ TLR4 cells.

## DESCRIPTION

Adenosine triphosphate (ATP), a potassium efflux agent, can trigger the activation of NALP3 inflammasome in response to PAMPs, such as lipopolysaccharide (LPS) and peptidoglycan. It stimulates the caspase-1-dependent cleavage and secretion of IL-1β from LPS-stimulated cells<sup>3</sup>. ATP triggers the opening of the non-selective cation channel of the purinergic P2X7 receptor, followed by the gradual opening of a larger pore. The larger pore is attributed to pannexin-1, which is recruited upon P2X7 receptor activation<sup>4</sup>. Activation of the P2X7 receptor results in potassium efflux which is necessary for activation of the post-translational maturation of IL-1β<sup>5</sup>.

1. Mariathasan S. *et al.*, 2006. Cryopyrin activates the inflammasome and ATP. *Nature* 440:228-32. 2. Locovei S. *et al.*, 2007. Pannexin1 is part of the pore forming unit of the P2X(7) receptor death complex. *FEBS Lett.* 581(3):483-8. 3. Perregaux D. & Gabel CA., 1994. Interleukin-1b maturation and release in response to ATP and nigericin. *J Biol. Chem.* 269:15195-15203.

## CHEMICAL PROPERTIES

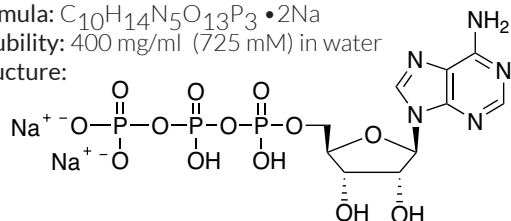
CAS Number: 987-65-5

Molecular weight: 551.14 (anhydrous form)

Formula: C<sub>10</sub>H<sub>14</sub>N<sub>5</sub>O<sub>13</sub>P<sub>3</sub> • 2Na

Solubility: 400 mg/ml (725 mM) in water

Structure:



## METHODS

### Preparation of stock solution (200 mM)

1. Add 9.072 ml of endotoxin-free water to 1 g of ATP.
2. Vortex until completely dissolved.  
*Note:* The ATP stock solution is acidic. The pH of this solution can be adjusted using 4 M NaOH.
3. Further dilutions can be prepared using the appropriate buffers.

### Detection of NLRP3 inflammasome induction

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

The synthesis of pro-IL-1β 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 μg/ml). Subsequent stimulation with 5 mM ATP leads to the formation of NLRP3 inflammasome resulting in IL-1β maturation and secretion. Secreted IL-1β can be detected by Western blot or ELISA. Alternatively, InvivoGen recommends the use of HEK-Blue™ IL-1b cells, a reporter cell line that specifically detects bioactive IL-1β. These cells express an NF-κB and AP-1-inducible SEAP (secreted alkaline phosphatase) reporter gene. The presence of IL-1β leads to NF-κB and AP-1 activation and the subsequent secretion of SEAP. Levels of SEAP can be easily determined with QUANTI-Blue™, a SEAP detection reagent that turn purple/blue in the presence of alkaline phosphatase. For more information, visit: <https://www.invivogen.com/inflammasome-test-cells>.

## RELATED PRODUCTS

Product	Catalog Code
HEK-Blue™ IL-1β Cells	hkb-il1b
LPS-EK (LPS from <i>E. coli</i> K12)	tlrl-eklps
PMA	tlrl-pma
THP1-Null Cells	thp-null
<b>Other NLRP3 inflammasome inducers:</b>	
Alum Hydroxide	tlrl-aloh
CPPD crystals	tlrl-cppd
Hemozoin	tlrl-hz
MSU crystals	tlrl-msu
Nano-SiO <sub>2</sub>	tlrl-sio
Nigericin	tlrl-nig
TDB (Trehalose-6,6-dibehenate)	tlrl-tdb

## TECHNICAL SUPPORT

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