

# BAY 11-7082

Inhibitor of NF- $\kappa$ B, I $\kappa$ B kinase, and the NLRP3 inflammasome

Catalog code: tlr1-b82

<https://www.invivogen.com/bay11-7082>

For research use only

Version 20110-MM

## PRODUCT INFORMATION

### Contents

- 10 mg BAY 11-7082

### Storage and stability

- BAY 11-7082 is shipped at room temperature. Upon receipt, store at -20 °C.
- Upon resuspension, prepare aliquots and store at -20 °C. Resuspended product is stable for at least 6 months at -20 °C when properly stored. Avoid repeated freeze-thaw cycles.

### Quality control

- Purity:  $\geq$ 95% (UHPLC)
- The inhibitory activity has been confirmed using in-house 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

BAY 11-7082 was first described as an irreversible inhibitor of the NF- $\kappa$ B pathway<sup>1</sup>. Specifically, it inhibits the phosphorylation of I $\kappa$ B- $\alpha$ , which is essential for the release of NF- $\kappa$ B from the cytosolic I $\kappa$ B- $\alpha$ /NF- $\kappa$ B complex. The transcription factor NF- $\kappa$ B regulates multiple aspects of innate and adaptive immune functions and serves as a pivotal mediator of inflammatory responses.

Further studies have revealed that BAY 11-7082 has multiple targets, including the NLRP3 inflammasome sensor<sup>2</sup>. The NLRP3 inflammasome is activated by a two-step process. First, a priming step induces the NF- $\kappa$ B-dependent transcription of pro-IL-1 $\beta$  and of the NLRP3 sensor. The second step triggers the multimerization of the activated sensor with ASC and pro-caspase-1 molecules. This assembly allows caspase-1 self-activation, which in turn induces the maturation and secretion of IL-1 $\beta$  and IL-18 cytokines, along with alarmins, and a pyroptotic cell death. Thus, BAY 11-7082 may inhibit the inflammasome responses indirectly by preventing the nuclear translocation of NF- $\kappa$ B at the priming step. Moreover, BAY 11-7082 was shown to exhibit direct inhibitory functions on the NLRP3 inflammasome by blocking the sensor's ATPase activity<sup>2</sup>. Of note, this inhibitor does not affect the NLRP1 inflammasome but it may partially inhibit the Salmonella-induced NLR4 inflammasome<sup>1</sup>. To conclude, BAY 11-7082 has been reported to display broad-spectrum anti-inflammatory activities and influence various physiological processes<sup>3,4</sup>.

1. Pierce JW. *et al.*, 1997. Novel inhibitors of cytokine-induced I $\kappa$ B phosphorylation and endothelial cell adhesion molecule expression show anti-inflammatory effects *in vivo*. *J. Biol. Chem.* 272:21096. 2. Juliana C. *et al.*, 2010. Anti-inflammatory compounds parthenolide and Bay11-7082 are direct inhibitors of the inflammasome. *J. Biol. Chem.* 285:9792-802. 3. Lee J *et al.*, 2012. BAY 11-7082 is a broad-spectrum inhibitor with anti-inflammatory activity against multiple targets. *Med. Inflammation.* 416036. 4. Xu C. *et al.*, 2019. Bay 11-7082 facilitates wound healing by antagonizing mechanical injury and TNF- $\alpha$ -induced expression of MMPs in posterior cruciate ligament. *Connect. Tissue Res.* 60 311.

## CHEMICAL PROPERTIES

CAS number: 19542-67-7

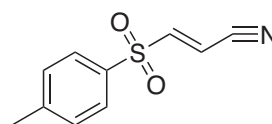
Synonym: (E)-3-(4-Methylphenylsulfonyl)-2-propenenitrile

Formula: C<sub>10</sub>H<sub>9</sub>NO<sub>2</sub>S

Molecular weight: 207.25 g/mol

Solubility: 25 mg/ml in DMSO and 15 mg/ml in ethanol

Structure:



## METHODS

### Preparation of stock solution (50 mM)

1. Add 965  $\mu$ l DMSO to 10 mg BAY 11-7082 vial.
2. Vortex until completely resuspended.
3. Prepare aliquots of BAY 11-7082 and store at -20 °C.
4. Once BAY 11-7082 is resuspended, further dilutions can be prepared using sterile aqueous buffers.

Working concentration: 1-20  $\mu$ M for cell culture assays

## PROTOCOLS

For reference only; as described in the indicated publications.

### Cell Culture Assay<sup>5</sup>

Cells: Bone marrow-derived macrophages

Working concentration: 1 - 10  $\mu$ M

Incubation time: 30 min - 3 h

Method: ELISA

### Cell Culture Assay<sup>6</sup>

Cells: NCI-H1703 cells non-small cell lung carcinoma cell line

Working concentration: 8  $\mu$ M

Incubation time: 12 h

Method: Cell proliferation

## RELATED PRODUCTS

Product	Description	Cat. Code
Dexamethasone	NF- $\kappa$ B inhibitor	tlr1-dex
MCC950	NLRP3-inflammasome inhibitor	inh-mcc
Resveratrol	NF- $\kappa$ B inhibitor	tlr1-resv

## TECHNICAL SUPPORT

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