BAY 11-7082

Inhibitor of NF-κB, IκB kinase, and the NLRP3 inflammasome - InvitroFit™

Catalog code: tlrl-b82, tlrl-b82-5

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

For research use only

Version 23L08-MM

PRODUCT INFORMATION

Contents BAY 11-7082 is available in two quantities:

- **tlrl-b82:** 10 mg BAY 11-7082 -InvitroFit™
- **tlrl-b82-5:** 5 x 10 mg BAY 11-7082 -InvitroFit™

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 3 months at -20 °C when properly stored. Avoid repeated freeze-thaw cycles.

Quality control

- Purity: ≥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

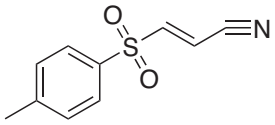
BAY 11-7082 was first described as an irreversible inhibitor of the NF-κB pathway[1]. Specifically, it inhibits the phosphorylation of IκB-α, which is essential for the release of NF-κB from the cytosolic IκB-α/NF-κB complex. The transcription factor NF-κB regulates multiple aspects of innate and adaptive 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[2]. The NLRP3 inflammasome is activated by a two-step process. First, a priming step induces the NF-κB-dependent transcription of pro-IL-1β 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-1β 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-κB 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[2]. Of note, this inhibitor does not affect the NLRP1 inflammasome but it may partially inhibit the Salmonella-induced NLRC4 inflammasome[1]. To conclude, BAY 11-7082 has been reported to display broad-spectrum anti-inflammatory activities and influence various physiological processes[3,4].

1. Pierce JW. *et al.*, 1997. Novel inhibitors of cytokine-induced Ikappa Balpha 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-α-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: $C_{10}H_9NO_2S$
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 µl 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 µM for cell culture assays

PROTOCOLS

For reference only; as described in the indicated publications.

Cell Culture Assay[5]
Cells: Bone marrow-derived macrophages
Working concentration: 1 - 10 µM
Incubation time: 30 min - 3 h
Method: ELISA

Cell Culture Assay[6]
Cells: NCI-H1703 cells non-small cell lung carcinoma cell line
Working concentration: 8 µM
Incubation time: 12 h
Method: Cell proliferation

RELATED PRODUCTS

Product	Description	Cat. Code
Ac-YVAD-cmk	Caspase -1 inhibitor	inh-yvad
MCC950	NLRP3-inflammasome inhibitor	inh-mcc

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