Parthenolide
Caspase-1 and inflammasome inhibitor
Catalog code: inh-ptd
https://www.invivogen.com/parthenolide

For research use only
Version 2010-MM

PRODUCT INFORMATION
Contents:
- 50 mg Parthenolide

Storage and stability:
- Product is shipped at room temperature. Upon receipt, store at -20°C.
- Upon resuspension, prepare aliquots and store at -20°C. Resuspended parthenolide is stable for at least 6 months when properly stored. Avoid repeated freeze-thaw cycles.

Quality control:
- Purity ≥ 95% (UHPLC)
- The inhibitory activity has been validated using in-house cellular assays.
- The absence of bacterial contamination (e.g., lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and -4 cells.

DESCRIPTION
Parthenolide is a broad-spectrum inhibitor with numerous anti-inflammatory properties. Its targets include NF-kB, caspase-1, and multiple inflammasomes. The inflammasomes are innate immune sensors that drive the activation of inflammatory caspases including caspase-1. They are activated by a two-step process; a first signal ('priming') provided mainly by microbial components or endogenous cytokines involves NF-kB induction, while the second signal provided by a wide array of stimuli including microbial toxins, endogenous molecules or crystalline substances leads to inflammasome assembly and activation. Numerous inflammasomes have been described among them the NLRP3 inflammasome has been best characterized. Notably, this inhibitor blocks the activity of the NLRP1, NLRP3, NLRC4 inflammasomes, but not the AIM2 inflammasome. Mechanistically, it has been reported that parthenolide inhibits the IκB kinase function required for NF-kB activation, and alkylates the cysteine residues in caspase-1 and in the ATPase domain of NLRP3, thereby blocking their activity.

CHEMICAL PROPERTIES
Solubility: 25 mg/ml (101 mM) in DMSO or ethanol
CAS number: 20554-84-1
Formula: C15H20O3
Molecular weight: 248 g/mol
Structure:

![Parthenolide Structure](https://www.invivogen.com/structure.png)

Molecular Weight: 256,26
CAS number: 20554-84-1
25 mg/ml (101 mM) in DMSO or ethanol
Solubility:

METHOD
Preparation of 10 mg/ml (40.4 mM) stock solution
1. Weigh 10 mg of parthenolide.
2. Add 1 ml of DMSO to 10 mg parthenolide. Mix by vortexing.
3. Prepare further dilutions using sterile endotoxin-free water.

In vitro inhibition of caspase-1:
The following protocol describes the monitoring of caspase-1 inhibition in human THP1-Null2 cells by assessing the inhibition of IL-1β production.
1. Prepare a THP1-Null2 cell suspension and add 3 x 10⁵ cells per well in a 96-well plate.
2. Prime cells by adding 1 μg/ml LPS-EK for 3 hours at 37°C in 5% CO₂.
3. Gently remove medium and add fresh test medium.
4. Stimulate cells by adding IL-1β inducers, such as MSU crystals (100-200 mg/ml) in the presence or absence of Parthenolide (0.5-50 μg/ml).
5. Incubate from 6 hours to overnight at 37°C in 5% CO₂.
6. Determine caspase-1 inhibition by detecting mature IL-1β in InvivoGen’s HEK-Blue™ IL-1β cells, which are specifically engineered to detect bioactive IL-1β.

PROTOCOLS
For reference only; as described in the indicated publications.

Cell Culture Assay
Cells: Wild-type bone marrow-derived macrophages
Working concentration: 10 μM (2.5 μg/ml)
Pre-incubation: 15 minutes
Method: In vitro caspase-1 activation by SDS-PAGE, followed by immunoblotting with anti-human caspase-1 p30 antibody.

Animal Study
Animal model: Nude nude mice
Dose: 25 mg/kg
Administration: Intraperitoneal injection

RELATED PRODUCTS

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<tr>
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