Product Data Sheet

Chemical Properties

Product Name: Bortezomib (PS-341)

Cas No.: 179324-69-7

M.Wt: 384.24

Formula: C19H25BN4O4

Synonyms: Bortezomib, PS-341, LDP-341, MLM341, MG-341, NSC-681239

Chemical Name: [(1R)-3-methyl-1-[[2S)-3-phenyl-2-(pyrazine-2-carbonylamino)propionyl]amino]butyl]boronic acid

Canonical SMILES: B(C(CC(C)C)(=O)C(CC1=CC=CC=C1)NC(=O)C2=NC=CN=C2)(O)O

Solubility: >19.2mg/mL in DMSO

Storage: Store at -20°C

General tips: For obtaining a higher solubility, please warm the tube at 37°C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shopping Condition: Evaluation sample solution: ship with blue ice
All other available size: ship with RT, or blue ice upon request

Biological Activity

Targets: Proteasome

Pathways: Ubiquitination/Proteasome >> Proteasome

Description:

Bortezomib (originally codenamed PS-341) is the first therapeutic proteasome inhibitor to be tested in humans. It is approved in the U.S. for treating relapsed multiple myeloma and mantle cell lymphoma. [1] The drug is an N-protected dipeptide and can be written as Pyz-Phe-boroLeu, which stands for pyrazinoic acid, phenylalanine and Leucine with a boronic acid instead of a carboxylic acid. Peptides are written N-terminus to C-terminus, and this convention is used here even though the "C-terminus" is a boronic acid instead of a carboxylic acid. While multiple
mechanisms are likely to be involved, proteasome inhibition may prevent degradation of pro-apoptotic factors, permitting activation of programmed cell death in neoplastic cells dependent upon suppression of pro-apoptotic pathways. Recently, it was found that bortezomib caused a rapid and dramatic change in the levels of intracellular peptides that are produced by the proteasome. [2] Some intracellular peptides have been shown to be biologically active, and so the effect of bortezomib on the levels of intracellular peptides may contribute to the biological and/or side effects of the drug.

A potent (Ki = 0.6 nM), specific and reversible proteasome inhibitor. It inhibits cell proliferation of H460 cells (Human non-small cell lung cancer cell lines) with an IC50 of 0.1 µM.

Reference:

Protocol

Cell experiment:

Cell lines Canine malignant melanoma cell lines (CMM-1, CMM-2, ChMC, KMeC, LMeC, OMJ, OMS, OMK, and NML)

Preparation method The solubility of this compound in DMSO is >10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Reacting conditions 72h; IC50=3.5~5.6 nM (nine kinds of cells)

Applications Bortezomib potently suppressed the growth in 21 drugs, while other compounds had no or minimal effect on cell growth. We thus focused on bortezomib and examined its growth inhibitory properties against nine canine malignant melanoma cell lines (CMM-1, CMM-2, ChMC, KMeC, LMeC, OMJ, OMS, OMK, and NML). Bortezomib inhibited the growth of all cell lines with calculated IC50 values of 3.5~5.6 nM.

Animal experiment [3]:

Animal models Nude athymic mice

Dosage form 0.8 mg/kg; intravenous injection
Applications

The in vivo growth inhibitory activity of bortezomib against CMM-1 cells was evaluated using a xenograft mouse model. Bortezomib significantly suppressed the growth of tumours after Day 4 of treatment (P < 0.01, control vs. bortezomib). Tumours from the bortezomib-treated mice showed a significant decrease in mitotic index compared to controls (P<0.01). Similarly, the Ki67 index was significantly decreased in tumours excised from the bortezomib-treated mice when compared to controls (P < 0.01).

Other notes

Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

Reference:


Product Citations


Product Validation

HeLa cells were untreated (-) or treated with 10 μm PS-341 (+) as indicated, 4 h later the cells were harvested and the lysates were subjected to immunoblot analysis with anti-ubiquitin or anti-p53 antibodies.
After treatment with 25 nm bortezomib and L for 24h, the degradation of HK2 was reduced compared with the cells treated with L alone.

Method: Immunoblot assays; Cell Lines: Breast cancer cell; Concentrations: 25nM; Incubation Time: 24 h.