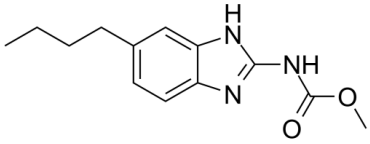
Data Sheet

Product Name:	Parbendazole
Cat. No.:	CS-0035171
CAS No.:	14255-87-9
Molecular Formula:	C13H17N3O2
Molecular Weight:	247.29
Target:	Microtubule/Tubulin; Parasite
Pathway:	Anti-infection; Cell Cycle/DNA Damage; Cytoskeleton
Solubility:	H2O : < 0.1 mg/mL (insoluble); DMSO : 4 mg/mL (16.18 mM; Need ultrasonic)



BIOLOGICAL ACTIVITY:

Parbendazole is a potent inhibitor of **microtubule** assembly, destabilizes tubulin, with an **EC_{50}** of 8.79 nM, and exhibits a broad-spectrum anthelmintic activity. IC50 & Target: EC50: 8.79 nM (tubulin)[1] **In Vitro:** Parbendazole is a tubulin destabilizer, with an EC_{50} of 8.79 nM, and can induce DNA damage[1]. Parbendazole (2-10 μM) inhibits the assembly of microtubules dose-dependently, with an IC_{50} of 3 μM. Parbendazole (2-20 μM)-treated cells show an complete absence of microtubules in Vero cells[2]. Parbendazole (up to 10 μM) inhibits the growth of CLd-AXE myxamoebae. Parbendazole (2-5 μM) potently inhibits tubulin purified from the wild-type myxamoebae[3].

PROTOCOL (Extracted from published papers and Only for reference)

Kinase Assay: [2]Pure tubulin is obtained from sheep brain by 2 cycles of assembly and disassembly in vitro. Immediately prior to use the protein is centrifuged at 130000 g for 30 min to remove any aggregates. It is used at a protein concentration of 0-2 mg/mL in 0.025 M Pipes buffer, 0-5 mM EGTA, 0-25 mM $Mg^2SOsup>4$, 0.1 mM GTP. Drug binding is determined by equilibrium dialysis using concentrations of **parbendazole between 0.1 μM and 4 μM**, and 2% (v/v) DMF (dimethyl formamide) as a carrier. Equilibrium is achieved by constant stirring for 2 h at 26°C, bovine serum albumin being used as a standard. 200 μL aliquots are counted in PCS in a 25-200B liquid scintillation counter[2]. **Cell Assay:** Parbendazole is dissolved in DMSO.[2]**Vero cells**, an established cell line derived from monkey kidney are seeded in DMEM supplemented with 10% (v/v) foetal calf serum onto glass coverslips in multiwell dishes. They are allowed to settle, and spread for 2-5 h in a humid atmosphere at 37°C. After this time the medium is changed to DMEM containing **2, 10 or 20 μM parbendazole and 1% (v/v) DMSO** controls contained 1 % (v/v) DMSO or had no additions[2].

References:

[1]. Lo YC, et al. Computational Cell Cycle Profiling of Cancer Cells for Prioritizing FDA-Approved Drugs with Repurposing Potential. Sci Rep. 2017 Sep 12;7(1):11261.

[2]. Havercroft JC, et al. Binding of parbendazole to tubulin and its influence on microtubules in tissue-culture cells as revealed by immunofluorescence microscopy. J Cell Sci. 1981 Jun;49:195-204.

[3]. Foster KE, et al. A mutant beta-tubulin confers resistance to the action of benzimidazole-carbamate microtubule inhibitors both in vivo and in vitro. Eur J Biochem. 1987 Mar 16;163(3):449-55.

CAIndexNames:

Carbamic acid, N-(6-butyl-1H-benzimidazol-2-yl)-, methyl ester

SMILES:

O=C(OC)NC1=NC2=CC=C(CCCC)C=C2N1

Caution: Product has not been fully validated for medical applications. For research use only.

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