

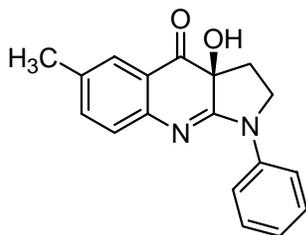
Product Information

(-)-Blebbistatin

Product Number **B 0560**

Store at -20 °C

Chemical Name: 1-Phenyl-1,2,3,4-tetrahydro-4-hydroxypyrrolo[2,3-b]-7-methylquinolin-4-one



Product Description

Molecular Formula: C₁₈H₁₆N₂O₂

Molecular Weight: 292.3

Cytokinesis is the final stage of mitosis when two daughter cells separate. Much of basic research identifying the components in cytokinesis pathway has been done on fission yeast and slime mold, consequently less detail is known about the process in mammalian cells. The cytoskeleton and membrane system of the cell undergo a complex series of coordinated changes on a time scale of minutes for cytokinesis to occur. A key structure, the contractile ring/cleavage furrow, consists of an actin-binding protein (anillin), the septins, actins, myosin II and tyrosine phosphorylated proteins. It has been established that non-muscle myosin II motor provides the force for furrow ingression and a second pathway positions anillin required for cell separation. On-going investigations involve the identification of myosin mediated and non-myosin related steps.

Blebbistatin was identified in a small molecule screen on HeLa cells.^{1,2} The name is derived from its inhibition of cell blebbing. Blebbistatin, is a cell permeable, specific inhibitor of nonmuscle myosin II. It was found to arrest furrow ingression without blocking furrow assembly via inhibition of myosin II. Inhibition leads to the formation of binucleate HeLa cells in culture and is fast-acting (disruption of cytokinesis observed within five minutes of addition), potent and reversible. Another group of authors has shown inhibition of cell migration, invasiveness and impairment of cell spreading.³ Blebbistatin is the pure active S-enantiomer. The IC₅₀ for myosin II Mg.ATPase is 2 μM.¹

Major thrusts in this area of research are being made in dissecting the temporal and spatial organizations of the dynamic cytokinesis machinery. The selectivity, potent, fast and reversible action of blebbistatin makes it a potential contributor in these discovery efforts.

References

1. Straight, A.F., et al., Dissecting temporal and spatial control of cytokinesis with a myosin II inhibitor. *Science*, **299**, 1743-1747 (2003).
2. Straight, A.F., et al., Dissecting cytokinesis with small molecules. *Amer. Soc. Cell Biol., Abstr.* 2515 (2002).
3. Duxbury, M.S., et al., Inhibition of pancreatic adenocarcinoma cellular invasiveness by blebbistatin: a novel myosin II inhibitor. *Biochem. Biophys. Res. Commun.*, **313**, 992-997 (2004).
4. Limouze, et al., Blebbistatin, a myosin II inhibitor with interesting photochemical properties. *Amer. Soc. Cell Biol., Abstr.* 2562 (2002).

KAA 06/04

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