Pegylated Liposomal Nanoparticle-based Docetaxel Prodrug MNK-010

National Cancer Institute

Source

National Cancer Institute. Pegylated Liposomal Nanoparticle-based Docetaxel Prodrug MNK-010. NCI Thesaurus. Code C116869.

A formulation containing pegylated liposomal nanoparticles encapsulating a prodrug of the poorly water-soluble, second-generation taxane analog docetaxel, with potential antineoplastic activity. Upon intravenous administration of the liposomal docetaxel prodrug MNK-010, docetaxel is slowly released into the systemic circulation and accumulates at the tumor site due to the unique characteristics of the tumor's vasculature. In turn, docetaxel is taken up by tumor cells, and subsequently binds to and stabilizes the beta-subunit of tubulin, thereby stabilizing microtubules and inhibiting microtubule disassembly. This results in cell cycle arrest and induces cell death. Compared to the administration of docetaxel alone, this formulation is able to increase the delivery of docetaxel into tumors, thereby increasing docetaxel's efficacy while minimizing its toxicity. In addition, this formulation solubilizes docetaxel without the use of toxic solvents, thereby permitting the administration of larger doses of docetaxel while avoiding solvent-associated toxicity.