Honokiol

Honokiol is a lignan present in the cones, bark, and leaves of Magnolia grandiflora that has been used in the traditional Japanese medicine Saiboku-to as an anxiolytic, antithrombotic, antidepressant, antiemetic, and antibacterial.

Honokiol was identified as an inhibitor of aromatase, with a half-maximal inhibitory concentration (IC(50)) of about 50 muM. In addition, honokiol was shown to be an inhibitor of 5-alpha-reductase type 1, with an IC(50) of about 75 muM. (Bernard, Scior et al. 2012)

Honokiol produces anti-neoplastic effects on melanoma cells in vitro. Melanoma cells in culture underwent cell death, had increased cytosolic cytochrome c, showed greater caspase activity, and demonstrated increased mitochondrial depolarization after treatment when compared to controls. (Mannal, Schneider et al. 2011)

5-Formylhonokiol), a derivative of honokiol, exerts anti-angiogenesis activity via inactivating the ERK signaling pathway. (Zhu, Fu et al. 2011)

Anti-inflammatory activity of honokiol is through inhibition of protein kinase C, mitogen-activated protein kinase, and the NF-kappaB pathway to reduce LPS-induced TNFalpha and NO expression. (Chao, Liao et al. 2010)

Honokiol-mediated inhibition of PI3K/mTOR pathway may be a potential strategy to overcome immunoresistance in glioma, breast, and prostate carcinoma without impacting T cell function. (Crane, Panner et al. 2009)

Honokiol has two major antiangiogenic and antitumor mechanisms of action. First, it blocks signaling in tumors with defective p53 function and activated ras by directly blocking the activation of phospholipase D by activated ras. Second, honokiol induces cyclophilin D, thus potentiating the mitochondrial permeability transition pore, and causing death in cells with wild-type p53. (Fried and Arbiser 2009)

Down-regulation of c-Src/EGFR-mediated signaling activation is involved in the honokiol-induced cell cycle arrest and apoptosis in MDA-MB-231 human breast cancer cells. (Park, Min et al. 2009)

Honokiol inhibits growth of human prostate cancer cells (PC-3) xenografts in vivo in association with apoptosis induction. (Hahm, Arlotti et al. 2008)

Liposomal honokiol combined with adriamycin has synergistic antitumor effects in breast cancer models. In vitro, liposomal honokiol inhibited the

proliferation of 4T1 cells via apoptosis and significantly enhanced the apoptosis of 4T1 cells induced by adriamycin. In vivo, the systemic administration of liposomal honokiol and adriamycin significantly decreased tumor growth through increased tumor cell apoptosis compared with either treatment alone. (Hou, Chen et al. 2008)

Honokiol induces apoptosis and inhibits angiogenesis of ovarian tumor cells. Honokiol significantly inhibited proliferation and induced apoptosis, with alteration of Bcl-2 members and caspase-3. Administration of honokiol to tumor-bearing animals decreased microvessel densities and resulted in inhibition of tumor growth. (Li, Liu et al. 2008)

Treatment of different human breast cancer cell lines with honokiol resulted in a time- and concentration-dependent growth inhibition in both estrogen receptor-positive and -negative breast cancer cell lines, as well as in drug-resistant breast cancer cell lines such as adriamycin-resistant and tamoxifen-resistant cell lines. The inhibition of growth was associated with a G1-phase cell cycle arrest and induction of caspase-dependent apoptosis. (Liu, Zang et al. 2008)

Honokiol causes G0-G1 phase cell cycle arrest in human prostate cancer cells in association with suppression of retinoblastoma protein level/phosphorylation and inhibition of E2F1 transcriptional activity. (Hahm and Singh 2007)

Honokiol inhibits the bone metastatic growth of human prostate cancer cells. (Shigemura, Arbiser et al. 2007)

Honokiol inhibits in vitro and in vivo growth of breast cancer through induction of apoptosis and cell cycle arrest. (Wolf, O'Kelly et al. 2007)

Honokiol regulates the nuclear factor kappa B (NF-κB) activation pathway, an upstream effector of vascular endothelial growth factor (VEGF), MCL1, and cyclooxygenase 2 (COX-2), all significant pro-angiogenic and survival factors. (Ahn, Sethi et al. 2006)

Honokiol inhibits angiogenesis in vitro and tumor growth in vivo. (Bai, Cerimele et al. 2003)

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