A systematic review of the anticancer properties of berberine, a natural product from Chinese herbs.


Source

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Abstract

Natural products represent a rich reservoir of potential small chemical molecules exhibiting antiproliferation and anticancer properties. An example is berberine, a protoberberine alkaloid widely distributed in medical plants used in traditional Chinese prescriptions. Recent advances have shown that berberine exerts anticancer activities both in vitro and in vivo through different mechanisms. Berberine shows inhibitory effects on the proliferation and reproduction of certain tumorigenic microorganisms and viruses, such as Heliobacter pylori and hepatitis B virus. Transcriptional regulation of some oncogene and carcinogenesis-related gene expression and interaction with both DNA and RNA are also well documented. Besides, berberine is a broad spectrum enzyme inhibitor, which affects N-acetyltransferase, cyclooxygenase-2, and topoisomerase activities and gene/protein expression. These actions, together with the regulation of reactive oxygen species production, mitochondrial transmembrane potential, and nuclear factor-kappaB activation might underlie its antiproliferative and proapoptotic effects. More importantly, the suppression of tumor growth and metastasis, the beneficial application in combined medication, and the improvement of multidrug resistance both in vivo and in vitro clearly show its potential as an alternative medicine for tumor chemotherapy.

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