

# Phytotherapy in hepato-oncology

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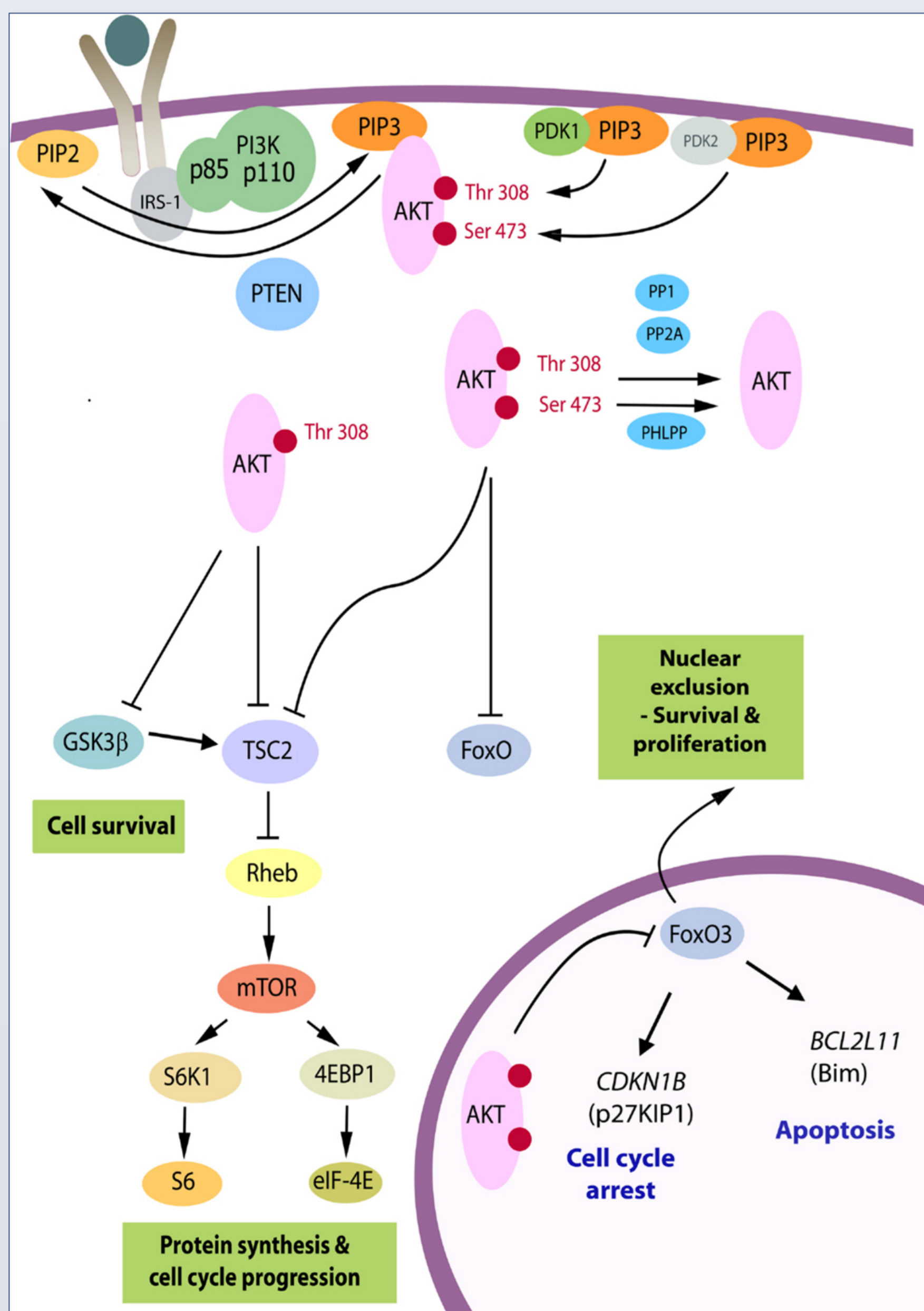
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## ABSTRACT

Hepatocellular carcinoma has a poor prognosis and is often developed by patients with hepatitis virus, alcoholism and liver diseases. The resistance of tumors against therapeutic procedures is increasing so many new oncologic drugs obtain from plants. Resveratrol, pine bark extract, piperine and curcumin showed already antineoplastic effect on hepatocellular carcinoma. These agents modulate p53 regulation and PI3K/AKT signalling pathway. It is possible that these agents could be used in the future as supportive therapy in hepato-oncology.

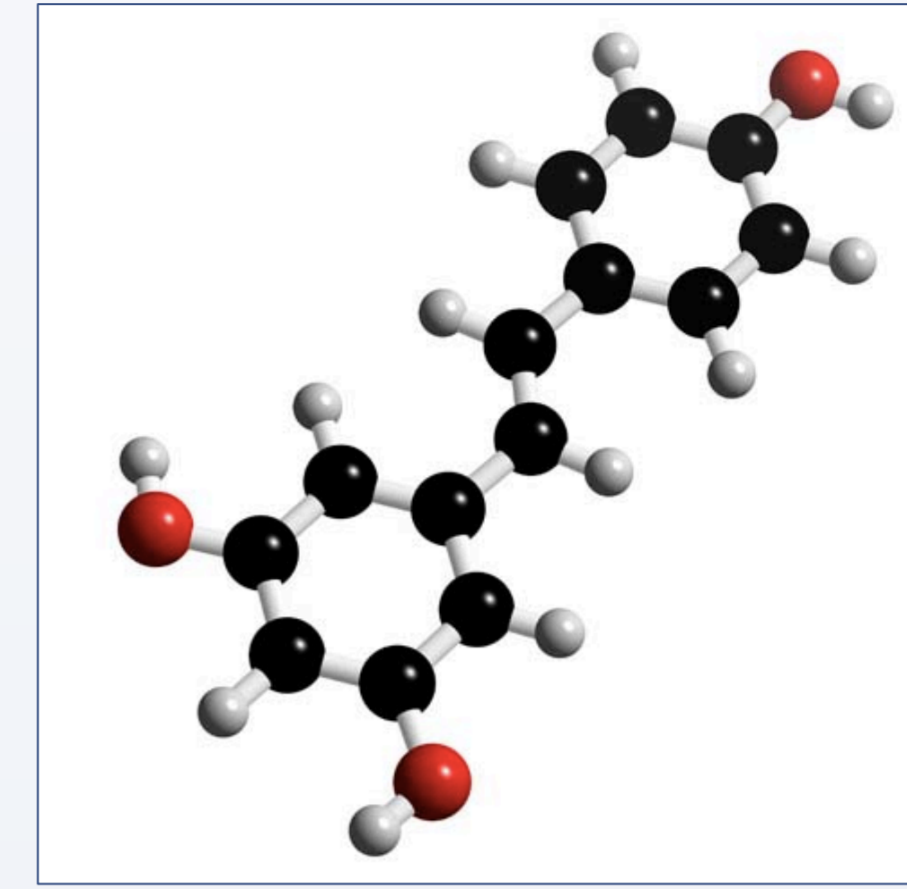
## OBJECTIVES

Hepatocellular carcinoma is a primary liver tumor. The risk factors to develop this cancer are infection with hepatitis virus, alcoholism and liver diseases. The prognosis of this disease is poor (1). In the last years, the resistance of tumors against therapeutic procedures is increasing. So many new oncologic drugs obtain from plants. Well known are also dietary supplements which showed already antineoplastic potential such as trans-resveratrol and a pine bark extract. In the literature are described in-vitro studies with both agents with HT1080 fibrosarcoma cell line (2,3). It was already showed that trans-resveratrol modulates sphingolipid metabolism in hepatocellular carcinoma cells, inhibits the progression of human hepatocellular carcinoma via regulating p53 and the phosphoinositide 3-kinase/protein kinase B pathway (4, 5). Trans-resveratrol also modulates PI3K/AKT signalling through SIRT1 modification (6). Also hepatic stellate cells play a crucial role in resveratrol-induced inhibition of hepatocellular carcinoma cell growth (7). Resveratrol showed also anti-metastatic activity in hepatocellular carcinoma through SP-1 modulation (8).



PI3K/AKT Signalling (<http://www.frontiersin.org>)

Oxyresveratrol inhibits hepatocellular carcinoma growth via modulation of angiogenesis and lymphangiogenesis (9). Pine bark extract showed already an inhibitory effect on hepatitis c virus replication so on one of risk factors of hepatocellular carcinoma (10). In the literature was also described a synergistic effect of piperine and curcumin in vitro and in vivo on the suppression of hepatocellular carcinoma cells (11).



Resveratrol (<http://www.3dchem.com>)

## CONCLUSIONS

Nowadays already many natural compounds showed in vitro but also in vivo study antineoplastic activity against hepatocellular carcinoma cells. It is possible that such agents could in the future be used as supportive therapy in hepato-oncology.

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