HIF-1alpha and calcium signaling as targets for treatment of prostate cancer by cardiac glycosides.


Source

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Abstract

Prostate cancer possesses its unique feature of low proliferation rate and slow growth. Ca(2+)-induced apoptosis is not dependent on cell cycle progression and targeting this pathway could circumvent the problems encountered using current cytotoxic chemotherapies for prostate cancer. Hypoxia-inducible factor 1alpha (HIF-1alpha) is another novel cancer drug target and inhibitors of hypoxia-response pathway are being developed. Digoxin and other cardiac glycosides, known inhibitors of the alpha-subunit of sarcolemmal Na(+)-K(+)-ATPase, were recently found to block tumor growth via the inhibition of HIF-1alpha synthesis. Thus, cardiac glycosides disrupt two important cellular pathways and, therefore, may be useful as an anticancer therapy. This review will focus on HIF-1alpha and calcium signaling as novel cancer drug targets in prostate cancer. The possible application of digoxin and other cardiac glycosides in cancer therapeutics especially in prostate cancer is discussed.

PMID:20025575