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RESEARCH PAPER

Green Tea: A Natural Source of Drug for Liver Cancer

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ABSTRACT : Green tea (*Camellia sinensis*) has anticancer activity in animal. The HBx protein of Hepatitis B virus activate AP-1 protein and it causes the down regulation of PTEN and p53 which are tumor suppressor genes, leads to the tumor formation in liver. The interactions between HBx and AP-1 have been targeted by docking of natural compounds. EGCG obtained from green tea shows highest affinity for AP-1 protein among all natural compounds. Affinity of EGCG with AP-1 protein may be used to design drug for liver cancer.

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Liver cancer, HBV, Activator protein-1, Natural compounds, EGCG, Docking

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Anticancer activity of several natural compounds has been experimental proved in research study. Green Tea (*Camellia sinensis*) is one of them and most popular beverage consumed in the word; it has anticancer activity. Hepatitis B virus infection is a leading source of liver cancer.The HBx protein of Hepatitis B virus activate AP-1 protein (Jacqueline Benn *et al.,* 1996), it causes the down regulation of PTEN and p53 gene (Wang *et al.,* 1994; Haviv *et al.,*1998). Therefore, tumor suppressors protein are not formed, it causes the tumor formation in liver. HBx protein plays a regulatory role in HBV replication and is necessary for in viral infection. It functions by protein-protein interaction and activation of transcription factor AP-1(Michael, 2010). When AP-1 protein is activated by HBx protein, the production of AP-1 protein is very high and cell division is uncontrolled which ultimately results in the formation of tumors in liver. Activation of AP-1 protein is repressed by several natural compounds, which modulate its target gene (Rahul Amin *et al.,* 2009). In this study docking interactions of natural compounds EGCG, curcumin, luteoline, genistein, ellagic acid, resveratrol, lupeol, betulinic acid, lycopene have been studied by analysing protein- protein interactions between HBx and AP-1. The interactions have been targeted by docking of natural compounds. Highest affinity of EGCG (-7.97) was predicted towards AP-1 protein and which may be involved in suppression of tumor formation process.

Material :

Databases :

NCBI(*http://www.ncbi.nlm.nih.gov/*), RCSB PDB(*www.rcsb.org*), PUBCHEM (*http://www.ncbi.nlm.nih.gov/pccompound*). Software/ Tools: LOOPP Server (*http://clsb.ices.utexas.edu/loopp/web/*), GRAMM X server (*http://vakser.bioinformatics.ku.edu/resources/gramm/grammx*), PyMOL(*http://www.pymol.org/).* Schrodinger- Maestro (*http://www.schrodinger.com*).

Methods :

Structures of natural compounds have been downloaded from Pubchem databases.