

AKT Isoforms as Target for Cancer

Naveen Dhingra*

Institute of Biological Science, SAGE University, Indore, Madhya Pradesh, India

***Corresponding Author:** Naveen Dhingra, Institute of Biological Science, SAGE University, Indore, Madhya Pradesh, India.

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Akt protein is encoded by three different genes viz. Akt1/PKB α , Akt2/PKB β and Akt3/PKB γ and are reported in various cellular functions including cell survival, proliferation etc. which plays crucial role in tumorigenesis. Akt signalling pathway is one of the most frequently altered signalling pathways in cancer. Today it has become an attractive target as anticancer therapy. In spite of ample research on Akt no Akt inhibitor has been yet approved for anticancer use. Very low numbers of compounds have been included in the clinical trials as specific Akt inhibitor. Report revealed that there has been both overlapping and contrasting functions of Akt isoforms. Various alternations are associated with Akt isoforms and have great implications in the development of cancer. These alternations also induce radio and chemo resistance to cancer cells.

Three Akt isoforms has its own importance in the altered cells of cancer. Predominant altered isoform of three Akt is Akt1 and is responsible for tumor growth, chemoresistance and cancer cell invasion. Breast, pancreatic, ovarian and colorectal carcinomas are the major cancers in which Akt2 was found to be altered. Akt2 is involved in metastasis and cancer cell invasion. Expression of Akt3 is limited to some tissues and mostly occurs in gliomas, melanomas and some breast. Akt3 is involved in tumor growth and resistance to drugs. Understanding the tumor expression profiles of Akt isoforms and its substrate specificity will help to explore the most active isoform involved in chemoresistance, tumor growth, migration, invasion and metastasis. As each isoform is involved in the cancer cell for its activities it is necessary to target multiple isoform for the inhibition of cancer progression. Akt isoforms shows divergent roles in different cancers and could be explored for their therapeutic potential in treating different cancer [1-12].

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