

## عنوان مقاله:

The Importance of RTK Signaling Genes and their Inhibitors in Breast Cancer

## محل انتشار:

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## خلاصه مقاله:

Receptor tyrosine kinase (RTK) signaling is a crucial pathway in the development of many cancers. KIT, PI3K, and AKT are the major genes in this pathway. KIT RTK functions in cell signal transduction in various cell types, such as cancer cells. A central element of RTK signaling is phosphatidylinositol-4, 5-bisphosphate 3-kinase catalytic subunit A (PIK3CA), involved in cell proliferation, survival, and growth. AKT is a serine/threonine-specific protein kinase that has an important role in several processes, such as apoptosis and cell proliferation. The importance of mutations and overexpression of KIT, PI3K, and AKT genes in breast cancer has been previously demonstrated. This review investigated the relationship between gene mutations and overexpression and clinicopathological variable of KIT, PI3K, and AKT in breast cancer. Finally, the role of inhibitor drugs of these genes in breast cancer treatment. These data were collected from PubMed and Google Scholar databases from 2000 to 2021. The expression of KIT, PI3K, and AKT genes in normal breast tissues has been observed. However, mutations and overexpression of these genes are associated with malignancies. The mutations in KIT, PI3K, and AKT genes are different from those found in other malignancies. Also, most of the drugs that inhibit the RTK signaling are being tested in clinical trials for the treatment of breast cancer. Monitoring and timely management of adverse effects are critical to minimize toxicities and optimize the efficacy of this targeted therapy. Therefore, further development of predictive biomarkers can better select patients who will benefit from RTK inhibitors.

## کلمات کلیدی:

AKT gene, Breast cancer, KIT gene, PI3K gene, RTK signaling

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