The PI3K-Akt-mTOR pathway and cancer

The PI3K-Akt-mTOR signaling pathway is a key regulator of normal cellular processes involved in cell growth, proliferation, motility, survival, and apoptosis.¹

![Diagram of the PI3K-Akt-mTOR pathway]

The role of Akt, a serine/threonine protein kinase, in cancer

- Akt is one of the most frequently activated protein kinases in human cancers²
  - Hyperactivation of Akt may induce cell growth and proliferation, and contribute to apoptotic resistance
- Akt activity has been correlated with various clinicopathologic parameters such as advanced disease³
- Akt activity is frequently elevated due to oncogenic growth factors, angiogenic factors, cytokines, steroid hormones (estrogen and androgen), and genetic alterations, including mutations of Akt and PI3K, and loss of function mutations of the PTEN tumor-suppressor gene⁴,⁵

mTOR=mammalian target of rapamycin; PI3K=phosphatidylinositol 3-kinase; PTEN=phosphatase and tensin homolog.

Information accurate as of June 2017.