

Protein Kinase C (PKC) Signaling

Protein Kinase C (PKC) is a family of enzymes that play a central role in signal transduction. It is activated by a variety of stimuli, including growth factors, hormones, and neurotransmitters. The activation of PKC leads to the phosphorylation of various target proteins, which in turn triggers a cascade of events that ultimately leads to the activation of transcription factors and the expression of specific genes. PKC is involved in a wide range of cellular processes, including cell growth, differentiation, and survival.

The PKC signaling pathway is initiated by the binding of a ligand to a cell surface receptor. This binding activates the receptor, which then activates a G-protein. The activated G-protein then activates phospholipase C (PLC), which cleaves phospholipids into diacylglycerol (DAG) and inositol trisphosphate (IP₃). DAG remains in the membrane, while IP₃ binds to and releases calcium from intracellular stores. The combination of DAG and calcium activates PKC. Activated PKC then phosphorylates various target proteins, including transcription factors such as CREB and NF- κ B. This phosphorylation leads to the translocation of these factors into the nucleus, where they bind to DNA and initiate the transcription of specific genes.

PKC is also involved in the regulation of cell growth and survival. For example, the activation of PKC by growth factors leads to the activation of transcription factors that promote cell proliferation. Conversely, the inhibition of PKC signaling can lead to cell death.