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characterized. Some examples include: The MAPK (mitogen-activated protein kinase) pathway: This pathway plays a crucial role in cellular responses to various extracellular stimuli, such as growth factors and stress signals. It involves a

responses to various extracellular stimuli, such as growth factors and stress signals. It involves a series of protein kinases that phosphorylate and activate each other, leading to the activation of downstream transcription factors and gene expression changes.

The PI3K/Akt/mTOR pathway: This pathway is involved in regulating cell growth, proliferation, and survival. It is activated by growth factors and insulin and controls processes such as protein synthesis, cell cycle progression, and metabolism.

The Wnt/ β -catenin pathway: This pathway regulates embryonic development, tissue homeostasis, and stem cell maintenance. It is activated by Wnt ligands and controls the stability and localization of β -catenin, a transcriptional co-activator.

The Notch pathway: This pathway is involved in cell fate determination and tissue patterning during development. It regulates gene expression and cell-cell communication through the interaction of Notch receptors and ligands.

The JAK/STAT pathway: This pathway is crucial for cytokine signaling and immune responses. It involves the activation of Janus kinases (JAKs), which phosphorylate and activate signal transducers and activators of transcription (STATs), leading to changes in gene expression.

These are just a few examples of the numerous molecular pathways that exist in cells. Each pathway is typically characterized by its specific components, mechanisms of activation, and downstream effects on cellular processes. The study of molecular pathways is essential for understanding the complex regulation of cellular functions and provides insights into various diseases and potential therapeutic targets.

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molecular interactions and events that occur within a cell to transmit signals from the external

Molecular pathways consist of a sequence of molecular components, such as proteins, enzymes, receptors, and small molecules, which interact with each other in a highly regulated manner. The interactions between these components can involve processes such as protein-protein interactions, enzymatic reactions, post-translational modifications, and the binding of small molecules to receptors.

growth, development, metabolism, and response to environmental cues.

A molecular pathway, also known as a signaling pathway or biochemical pathway, refers to a series of

environment to the cell's interior. These pathways are crucial for various cellular processes, including

