REVIEW ARTICLE

CELL SIGNALLING DYNAMICS IN THE HUMAN BODY PERTAINING TO CANCER

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ABSTRACT

Cell signalling is an intricate web of communication that plans and directs fundamental cellular functions. Normal tissue homeostasis, immunity, tissue repair and development - all depend on cells' capacity to sense and react appropriately to their surroundings. Diseases including diabetes, cancer and autoimmune disorders are caused by mistakes in the way that cells interpret information. Thus, it is essential to comprehend cell signalling to clarify the molecular causes of disease and create efficient treatments. Cancer cells exhibit altered signalling dynamics that promote abnormal proliferation and resistance to cell death. They exploit signalling pathways to support malignant characteristics, including enhanced survival, angiogenesis, invasion and metastasis. Key pathways frequently dysregulated in cancer include the PI3K/Akt/mTOR pathway, which promotes growth and survival; the MAPK pathway, which influences proliferation; and the Wnt signalling pathway, often involved in the control of gene expression, cytoskeletal rearrangement and cell adhesion.