

Carcinogenic Agents and their Role in Oncology

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Description

Carcinogenic agents encompass a diverse array of substances and environmental factors capable of initiating and promoting the development of cancer. Understanding the mechanisms by which these agents induce carcinogenesis is essential for cancer prevention, risk assessment, and therapeutic intervention in oncology. From chemical carcinogens to physical agents and biological agents, the role of carcinogenic agents in oncology is multifaceted and continues to be a focus of research and clinical investigation.

The class of carcinogenic agents known as chemical carcinogens, which includes both naturally occurring and synthesized substances, is one of the most well researched. Numerous processes, including as mutagenesis, DNA damage, and interference with cellular signaling pathways, are used by these chemicals to cause cancer. Industrial chemicals like formaldehyde and benzene, as well as aflatoxins created by mold in food, are examples of chemical carcinogens. Polycyclic Aromatic Hydrocarbons (PAHs) are contained in tobacco smoke. Leukemia, liver cancer, lung cancer, and other cancers are among the conditions for which long-term exposure to chemical carcinogens increases the chance of developing. Physical carcinogens are substances that cause cancer by either directly damaging cellular DNA or by encouraging mechanisms that lead to inflammation and cell division. One well-known physical carcinogen linked to the emergence of skin cancers, such as melanoma, basal cell carcinoma, and