

Factors affecting carcinogenesis

- ▶ These factors can be divided into three main groups:
 - ▶ Environmental Toxins
 - ▶ chemical
 - ▶ physical (e.g. radiation)
 - ▶ Dietary
 - natural products found in spices, etc.
 - additives (rarely)
 - ▶ Lifestyle
 - hormonally-mediated
 - other

Chemicals Generally Recognized as Carcinogenic in Humans

Industrial Exposures

Benzidine Urinary Bladder

Vinyl Chloride Liver

Certain tars Skin and

Asbestos Peritoneum (lungs when combined with cigarette smoking)

Benzene Lymphoid Tissue

Other Exposures

Diethylstilbestrol Vaginal

Arsenic Compounds Skin cancer

Cigarette Smoke Lungs, urinary tract

Betal Nut Buccal Mucosa

Carcinogenesis

▶ Initiation

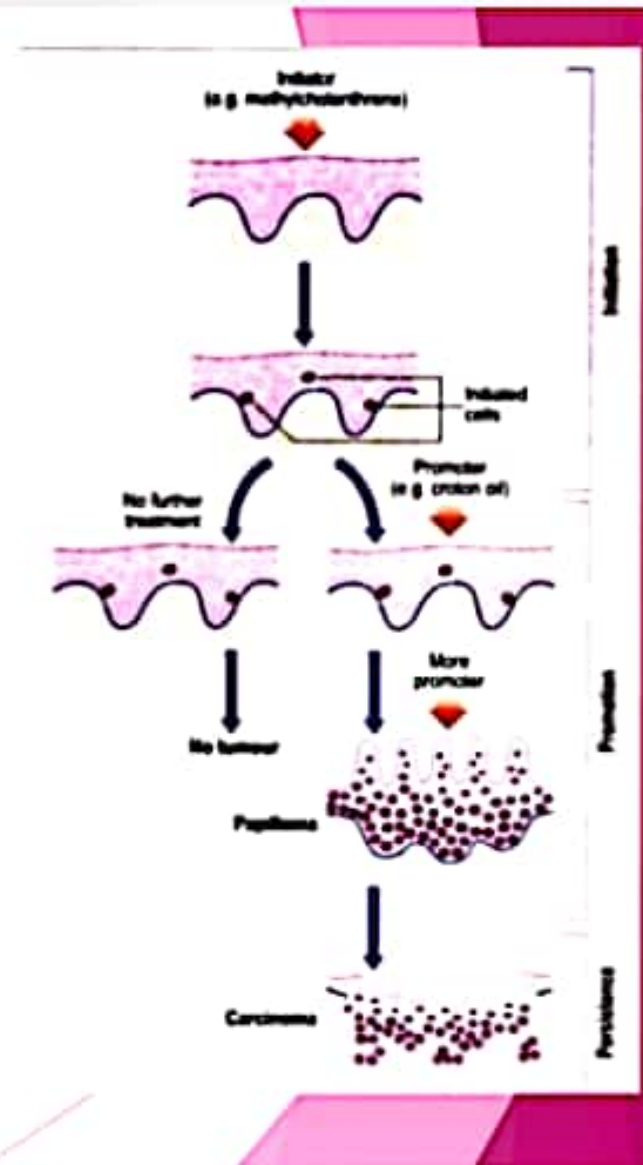
- ▶ DNA damage eg. Benzpyrene

▶ Promotion

- ▶ Histologic change - eg. Turpentine (co-carcinogens)

▶ Malignant transformation:

- ▶ Visible tumor formation - further DNA damage.



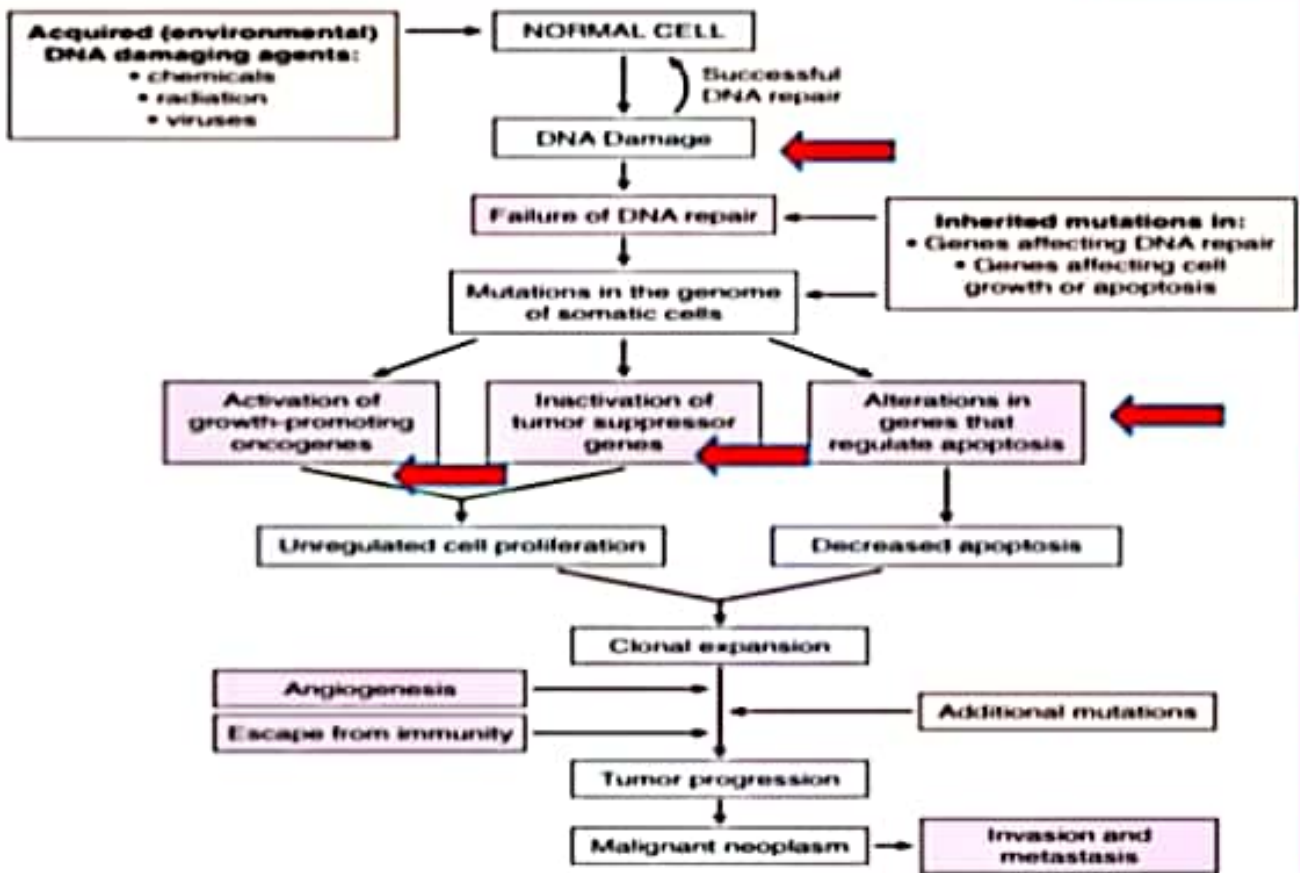
CARCINOGENESIS: ETIOLOGY and PATHOGENESIS OF CANCER

- pathogenesis of cancer undergoes in the following 4 mechanism
 - **Molecular pathogenesis of cancer (genes and cancer)**
 - **Chemical carcinogens and chemical carcinogenesis**
 - **Physical carcinogens and radiation carcinogenesis**
 - **Biologic carcinogens and viral oncogenesis.**

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Molecular Basis of Carcinogenesis:-

- ▶ Genes control cell division by cytokines.
- ▶ Four important classes of regulatory genes (for cell division):
 1. Promoters - Proto-oncogenes
 2. Inhibitors - Tumor or Cancer-suppressor genes - p53
 3. Genes regulating Apoptosis.
 4. DNA repair genes.



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