

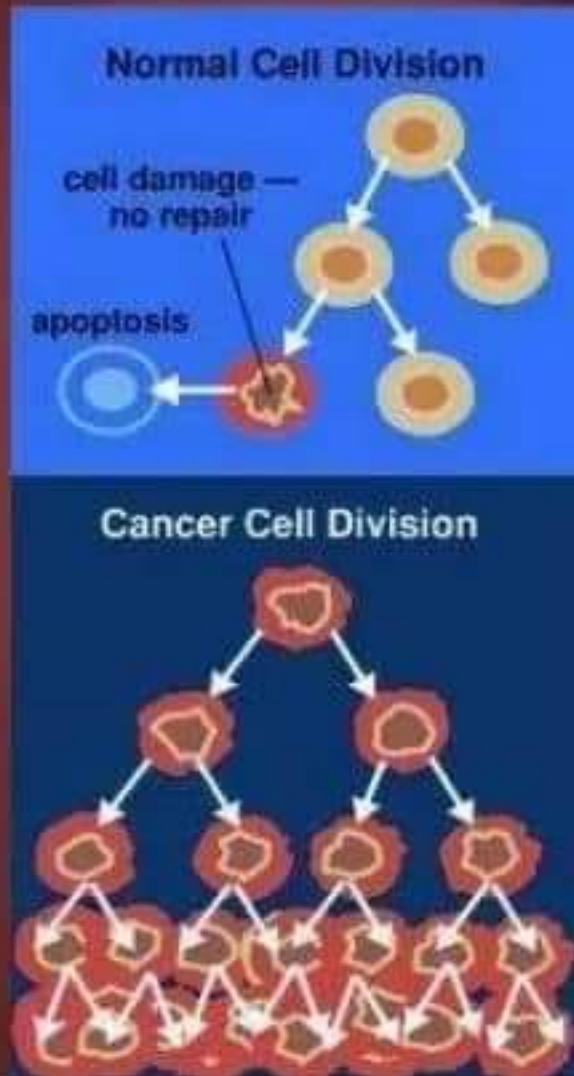
CANCER



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CELLULAR BASIS OF CANCER

- ❖ Cancer is collection of disease characterize by abnormal and uncontrolled growth.
- ❖ Cancer arises from a loss of normal growth control.
- ❖ In normal tissue, the rate of new cell growth and old cell death are kept in balance.
- ❖ But in cancer this balance is disrupted.
- ❖ This disruption can result from
 - Uncontrolled cell growth
 - Loss of cell ability to undergo apoptosis





- ❖ There are about 200 different types of cancer. It can start in any type of body tissue. What affects one body tissue may not affect another for example, tobacco smokes that you breath in may help to cause lung cancer.
- ❖ overexposing your skin to the sun could cause a melanoma on your leg. But the sun won't give you lung cancer and smoking won't give you melanoma.
- ❖ Apart from infection disease, most illnesses (including cancer) are multifactorial. This means that there are many factors involved. In other words, there is no single cause for any one type of cancer.

DEFINITION



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- ❖ Cancer is a term used to describe a large group of diseases that are characterized by a cellular malfunction.
- ❖ Healthy cells are programmed to “know what to do and when to do it”.
- ❖ Cancerous cells do not have this programming and therefore grow and replicate out of control. They also serve no physiological function. These cells are now termed a neoplasm
- ❖ Medically cancer is known ‘ Malignant neoplasm ’. It is a broad group of disease involving unregulated cell growth.
- ❖ The unregulated cell growth forms a ‘tumor’.

MALIGNANT TUMOR (CANCEROUS)

- ❖ This type of tumor are capable of invading surrounding tissue or invading the entire body.
- ❖ Invade and emit claw like protrusions that disrupt the RNA and DNA of normal cells (these cancerous cells act like a virus).
- ❖ Most malignant cells become 'metastatic'.

BENIGN TUMOR (NON-CANCEROUS)

- ❖ Benign tumor's are those tumor, which grow only in one place.
- ❖ They cannot spread or invade other parts of the body.
- ❖ Enclosed in fibrous shell or capsule.
- ❖ They can be dangerous if they press on vital organs such as 'brain'.
- ❖ It stay confined to its original location.

TUMOR

‘ This neoplastic mass often forms a clumping of cells known as a tumor ’.

‘ Tumor is a any abnormal proliferation of cell ’.

TUMOR'S ARE TWO TYPES

Benign tumor
(non-cancerous)

Malignant tumor
(cancerous)

CLASSIFICATION OF CANCER

❖ CARCINOMAS

It is a type of cancer that begins in a tissue that lies the inner and outer surface of the body, and generally arises from cells originating in the endodermic or ectodermic germ layer during embryogenesis.

❖ SARCOMA

It is a type of cancer that arises from transferred cells or mesenchymal origin.

❖ LYMPHOMA

It is a type of blood cancer, it occurs when T and B lymphocytes transform and begin growing and multiplying uncontrollably.

❖ LEUKEMIA

It is the type of the bone marrow characterize by an abnormal increase of immature WBC called 'blast'.

THEORIES OF CANCER GENESIS

STANDARD DOGMA

Carcinogens like chemical, tobacco, alcohol etc. altered DNA sequence of two cancer related genes which limit the cancer ability to divide and which stimulates the cell growth.

Mutation of these genes cause mutant cells grow and reproduce excessively which subsequently lead to the tumor formation and later metastasis.

MODIFIED DOGMA

Something like carcinogen, reactive oxidants disable one or more genes that regulates cell repair which leads to a significant increase in mutation rates.

EARLY-INSTABILITY THEORY

The chromosomal instability occurs early on as one or more master genes required for the cell division are silenced. After each generation the daughter cells more likely get wrong numbers of chromosome.

ALL ANEUPLOIDY THEORY

It state that the cancer arise aneuploid, aneuploidy is a change in the number of chromosome that can lead to a chromosomal abnormality.

STATISTICS OF CANCER

- ❖ According to the IARC and the specialized cancer agency of world health organization.
- ❖ Global burden rises to 14.1 million new cases and 8.2 million cancer deaths in 2012.
- ❖ an estimated 14.1 million new cancer cases and 8.2 million cancer-related deaths occurred in 2012.
- ❖ The most commonly diagnosed cancers worldwide were those of the lung (1.8 million, 13.0% of the total), breast (1.7 million, 11.9%), and colorectum (1.4 million, 9.7%). The most common causes of cancer death were cancers of the lung (1.6 million, 19.4% of the total), liver (0.8 million, 9.1%), and stomach (0.7 million, 8.8%).
- ❖ The estimated number of new cancer in India is about 7 lakhs and over 3.5 lakhs people die of cancer each year. Out of these 7 lakhs new cancer about 2.3 lakhs (33%) cancers are tobacco related.

MOLECULAR BASIS OF THE CANCER

- ❖ Cancer is a genetic disease.
- ❖ Mutation in genes result in altered proteins.
 - During cell division
 - External agents
 - Random event
- ❖ Most cancers result from mutations in somatic cells.
- ❖ Some cancers are caused by mutation in germline cells.
- ❖ The mutated form of gene is known as onco-genes.