

* classification of cancer : Tissue types

• Types of cancer - growth are consider either Benign (or) Malignant

• Based on tissue types cancers may be classified in to six

Major categories They are :

* Carcinoma - cancer that forms in Epithelial tissue

* Sarcoma - connective tissues - (soft tissues)

* Myeloma - Bone marrow (the cells grow too much)

* Melanoma - Melanocytes (develops in skin cells)

* Leukemia - inner part of the bones but often moves quickly in to the blood.

* Lymphoma - Lymphocytes (WBC)

* Mixed types - Two (or) more of the cancer

* Carcinoma :-

→ Carcinoma (or) Malignant tumours which originate from epithelial cells are known as "carcinoma".

→ Epithelial tissue lines most of the organs, the internal passage ways in the body like esophagus and skin

→ These tumours are commonly found / affecting the skin, Breast, Kidney, Liver, Lungs, pancreas, prostate gland

Head, and Neck are carcinomas. etc...

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Examples :-

- Adenocarcinoma - cancer of epithelial lining of glands & ducts.
- Melanoma - cancer of skin
- Hepatocellular carcinoma - cancer of liver
- Bronchial tumors - Lung cancer
- Basal cell carcinoma - } skin cancer
- Squamous cell carcinoma - }
- Adenosquamous carcinoma - glandular squamous [large cell]
- Renal cell carcinoma - kidney cancer
- Breast cancer / Invasive ductal carcinoma
- Adenoid cystic carcinoma

* **Sarcoma** :-

- Sarcoma (or) Malignant tumours are broad group of cancers that begin in the bone and in the soft tissue [connective tissue]. soft tissue sarcoma forms in the tissues that connect, support and surround other body structures.
- these tumours of mesenchymal origin are known as "sarcoma".
- These are the tumours of ^{connective} tissues like cartilage, fat, muscle, bloodvessels, bone, Nerves, fibrous tissue.

Examples :-

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- Chondro sarcoma - cartilage
- Angio sarcoma - Blood vessels
- Fibro sarcoma - fibroblasts
- Ewing sarcoma]
- osteo sarcoma] - Bone
- Rhabdo myo sarcoma - skeletal muscle.
- Liposarcoma - fat [Adipose tissue]
- Leiomyosarcoma - Smooth muscle
- Gastro intestinal - structural cells in the wall of
[epithelioid stromal tumor sarcoma] the intestine
- Mesothelial sarcoma - Membrous
- Myxo sarcoma - Embryonic connective tissue
- Glioma → Neurons ← [Astrocytoma]
- Synovial sarcoma - Joints
- undifferentiated sarcoma - ? Mesenchymal stem cell
- Alveolar soft part sarcoma
- Dermatofibro sarcoma
- Mixed mesodermal tumour - All connective tissues.

* **Myeloma** :- [Cancer of the Bone Marrow]

- Also called as Multiple Myeloma (or) Kohler's disease.
- Myeloma - A cancer of plasma cells
- This type of cancer originated in the "plasma cells".
- The plasma cells are a type of white blood cell in the Bone marrow. with this condition a group of plasma cells becomes cancerous and Multiplies.
- Due to the tumour and tumour products host response to its results in a Number of organ dysfunction and symptoms.
- Abnormal proliferation of plasma cells (multiple myeloma) able to produce a monoclonal immunoglobulin (M. protein) that may be identified on Serum (or) urine protein electrophoresis.

Examples :-

- plasmacytoma
- Monoclonal gammopathy - [abnormal antibody in the blood]
- Non- secretory myeloma
- Light chain myeloma
- solitary plasma cytoma
- Extramedullary plasmacytoma
- Smoldering Multiple myeloma
- Immunoglobulin D } myeloma
- Immunoglobulin E }
- Infections
- Bone fractures , pain
- confusion , constipation.

* **Melanoma** :- (Most serious type of skin cancer) - "Black tumor".

→ It is also called as "Malignant Melanoma" (or) skin cancer

→ Melanoma is a kind of skin cancer that starts in the melanocytes. that produce "Melanin".

→ Melanocytes are cells that make the pigment that gives colour to the skin become cancerous. that are commonly exposed to the sun.

→ Melanomas can occur any where on the body.

→ Treatment may involve - Surgery, radiation, Medication, chemotherapy.

Examples :-

• A melanoma Mole will often have different shades of the same colour, such as brown (or) Black.

• splotches of different colours - Examples - white,

Red colour, gray, Black, Blue



* **Leukemia** :- [Blood cancer]

- It is also called as Blood cancer.
- It is a group of Malignant disorder, affecting the blood and blood forming tissue of the bone marrow, lymph system and spleen.
- A malignant progressive disease in which the bone marrow and other blood forming organ produce ↑sed Numbers of immature (or) abnormal Leucocytes.
- These suppress the production of Normal blood cells.
- Treatment is highly variable.
- for slow growing Leukemias treatment may include consistent and repeat monitoring.
- for Aggressive Leukemias treatment includes chemotherapy that's some times followed by radiation and stem cell transplant.

Examples :-

- Chronic myelogenous Leukemia - myeloid Leukemia - WBC cancer
- Chronic Lymphocytic Leukemia - Make to many Lymphocytes.
- Hair cell Leukemia - accumulation of abnormal B-lymphocytes
- Acute Lymphocytic Leukemia - Lymphoblastic
- childhood Leukaemia -

- Blastic plasmacytoid dendritic cell Neoplasm
- Acute myelogenous Leukemia
- Juvenile myelomonocytic - (Occurs in children under 6yrs of age)
- Myeloproliferative Neoplasms.

* **Lymphoma** :- cancer of the Lymph nodes.

- it is also called as "Non-Hodgkin's Lymphoma" (NHL)
- it is a cancer of the Lymphatic system.
- Lymphoma is the type of cancer that begins in the immune system cell called Lymphocytes.
- There will be production of one (or) more abnormal cells in one (or) more of the Lymph nodes, spleen, thymus gland and bone marrow.
- This type of Lymphoma are Hodgkin's Lymphoma and Non-Hodgkin's Lymphoma.
- Treatment may involve chemotherapy, medication, radiation therapy and rarely stem cell transplant.

Examples :-

- Hodgkin Lymphoma
- Non-Hodgkin Lymphoma

- Chronic Lymphocytic Leukaemia.
- Small Lymphocytic Lymphoma

B-cell Lymphomas includes :

- Diffuse large B-cell Lymphoma
- follicular lymphoma
- primary mediastinal B-cell Lymphoma
- Mantle cell lymphoma
- post-transplant lymphoproliferative disorder
- Marginal zone Lymphoma
- Waldenstroma's macroglobulinemia
- Burkitt Lymphoma

T-cells Lymphoma :

- T-cell Lymphoblastic Lymphoma
- peripheral T-cell Lymphomas
- Extra nodal Natural killer Lymphoma
- Enteropathy-associated T-cell lymphoma
- Anaplastic Large cell Lymphoma.

* Mixed types :-

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→ These have 2 (or) more type components may be within one category (or) from different categories of cancer.

Examples :-

- Mixed mesodermal tumour
- Adenosquamous carcinoma
- Blastoma
- Osteosarcoma
- Teratocarcinoma

* Types of cancers

- Breast cancer
- Lung cancer
- Brain cancer
- Oesophagus cancer
- Blood cancer
- Laryngeal cancer
- Thyroid cancer
- Liver / Gall bladder cancer
- Stomach cancer
- Bone cancer
- Lymphoma
- Kidney cancer
- Uterus cancer
- Ovarian cancer
- Cervical cancer
- Prostate cancer
- Testicular cancer
- Colon and rectum cancer
- Pancreas cancer
- Etc.....

* stages of cancer :-

• stage-0 :-

- cancer cells found [abnormal cells are present]

• stage-1 :- "Early stage"

- A small, invasive mass (or) tumor has been found
- No spread to Lymph Nodes (or) other tissues
- It is called early stage (or) localized cancer.

• stage-2 :- "Localized"

- cancer has started to affect Near by tissue
- Mass may have grow in size
- Spread to Lymph Nodes Near the mass.

• stage-3 :- "Regional spread"

- cancer affects more surrounding tissue
- Mass may have grow in size
- spread to distant Lymph Nodes away from the mass.

• stage-4 :- "Distant spread"

- cancer has spread to other tissues (or) organs beyond the region where it originated.
- Some times called advanced (or) metastatic cancer.

* Grading system :-

- $G_1 \times$ - Grade cannot be assessed (Undetermined grade)
- $G_1 1$ - well differentiated (Low grade)
- $G_1 2$ - Moderately differentiated (Intermediate grade)
- $G_1 3$ - poorly differentiated (High grade)
- $G_1 4$ - undifferentiated (High grade)

* Disturbances of Growth of cells :-

- Cancer cells grow and divide in an uncontrolled manner, invading normal tissues and organs and eventually spreading throughout the body.

→ The various disturbances in growth are :

- * Aplasia :- Complete failure of an organ to develop

- * Agenesis :- Absence of an organ (or) specific cells from an organ.

- * Atrophy :- decrease in organ, tissue, cell (or) body part size.

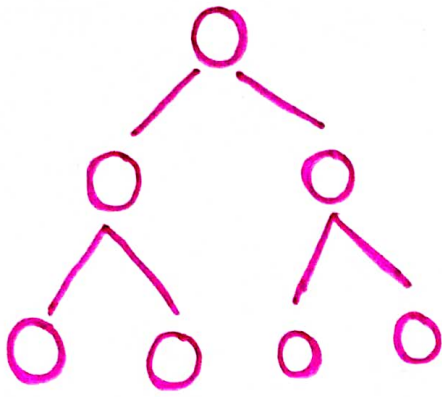
- physiologically, in all the organs and tissues of the human beings, a balance is maintained between cell renewal and cell Apoptosis - [programmed cell death].

- Every mature old cell has a specific life span after which it dies.

- New cells replace the old cells by proliferation and differentiation mechanisms.

- This entire process is so regulated that the number of specific type of cells remain constant without altering other processes.

* Normal cell reproduction :- "organized growth pattern"

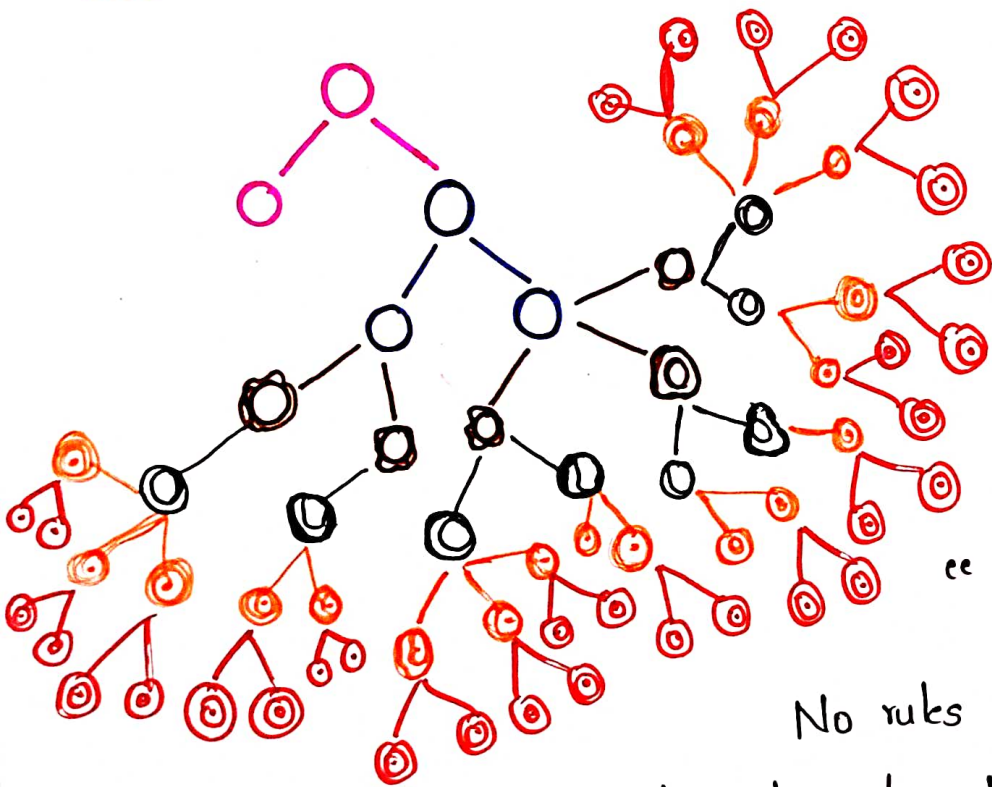


→ During Mitosis, a cell duplicates all of its contents, including its chromosomes and splits to form two identical daughter cells.

→ Because this process is so critical, the steps of Mitosis are carefully controlled by certain genes.

→ when Mitosis is not regulated correctly, Health problems causes such as "cancer".

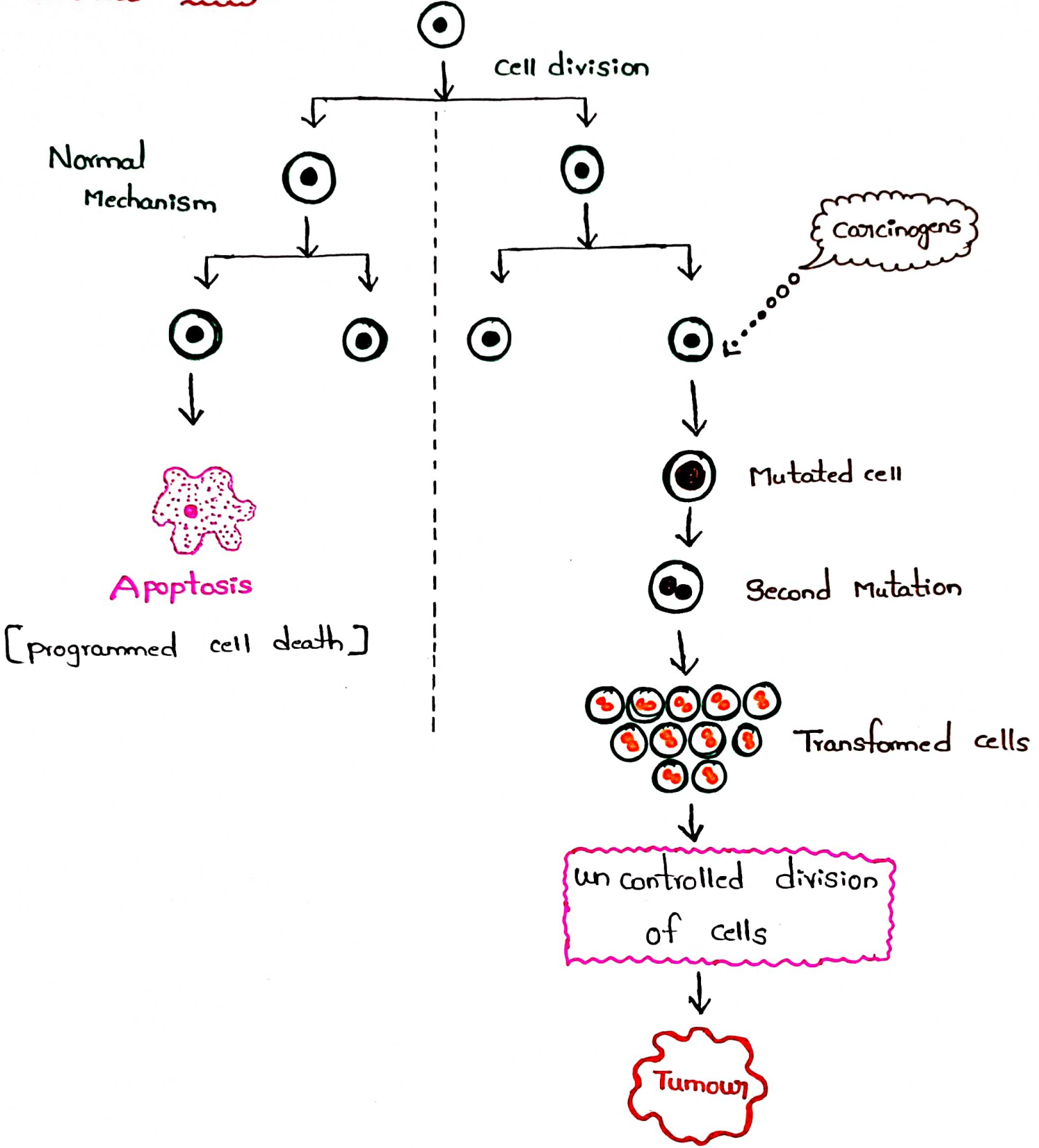
* Cancer cell reproduction :- "disorganized growth pattern"



"Cancer cells follow

No rules and have the ability to stimulate the growth of a New"

* Origin of tumour :-



- occasionally due to carcinogens (cancer causing agents), one of the cells get mutated and does not respond to Normal growth control Mechanisms.

- This mutated cell undergoes further mutations and transforms in to tumour cell which starts proliferating vigorously.

- This in turn results in a Mass of abnormal cell [tissues] called Neoplasm (or) tumour.