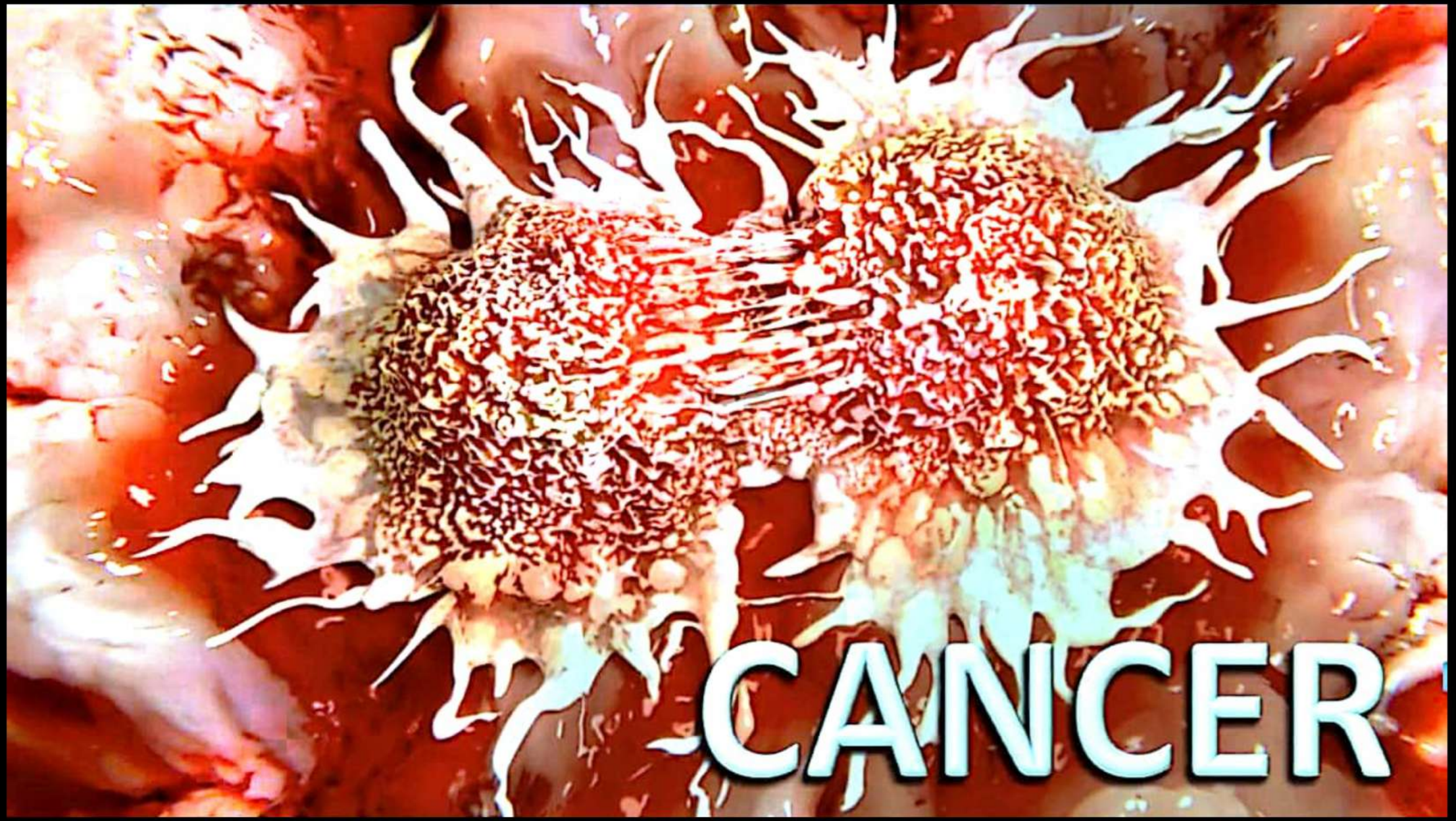
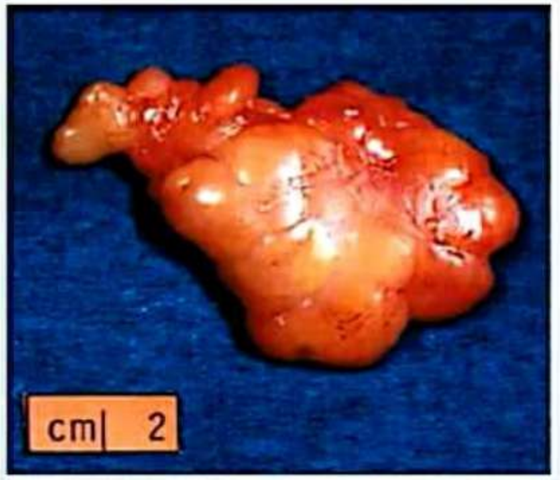

CANCER

CANCER



- Cancer is an abnormal and uncontrolled multiplication of cells resulting in the formation of tumors (masses of cells).
- Normal cells show a contact inhibition (contact with the other cells inhibits their uncontrolled growth). Cancer cells do not have this property.

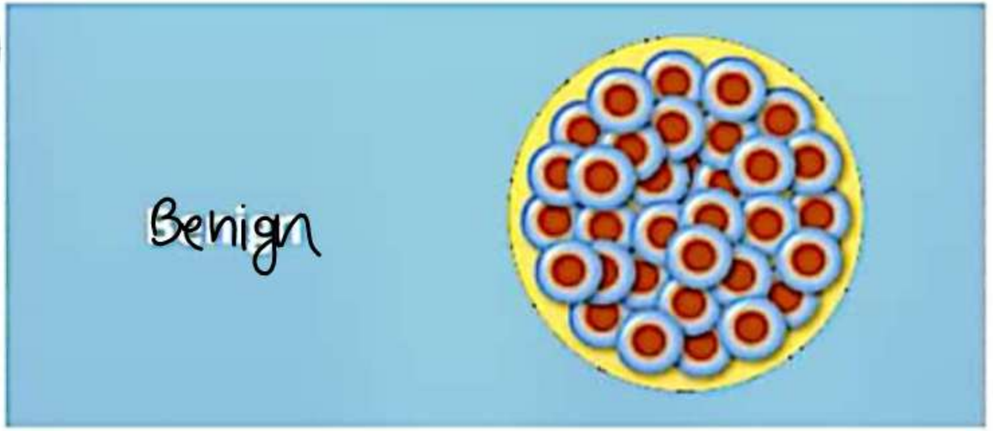
TYPES OF TUMORS

- **BENIGN**
- **MALIGNANT** → Dangerous.

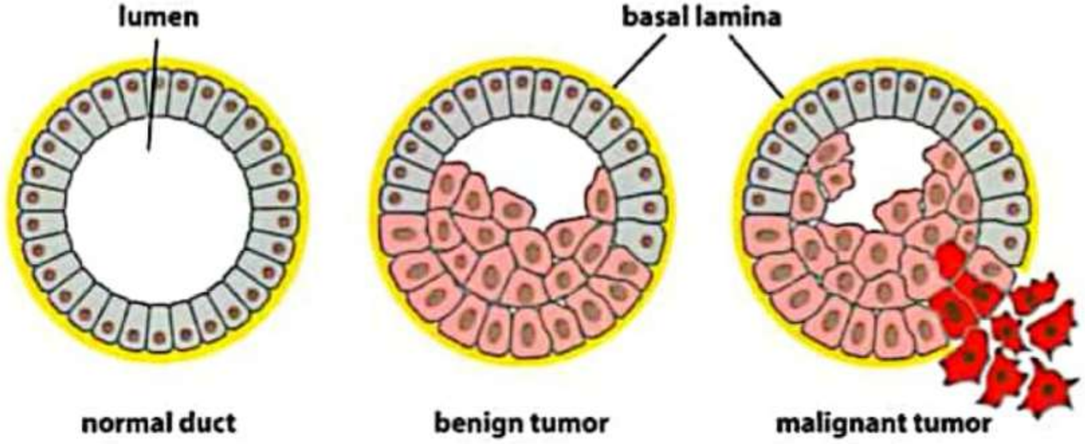
CANCER Types of tumours

1. Benign tumours (local)

- Confined to the place of its origin.
- They do not spread to other parts.



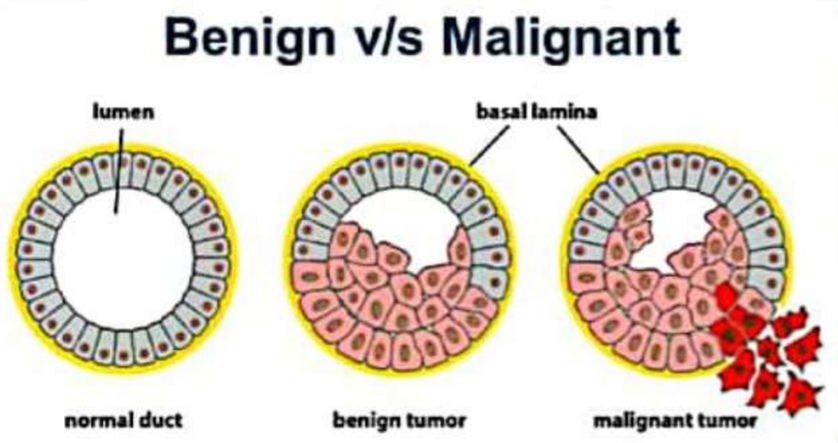
Benign v/s Malignant

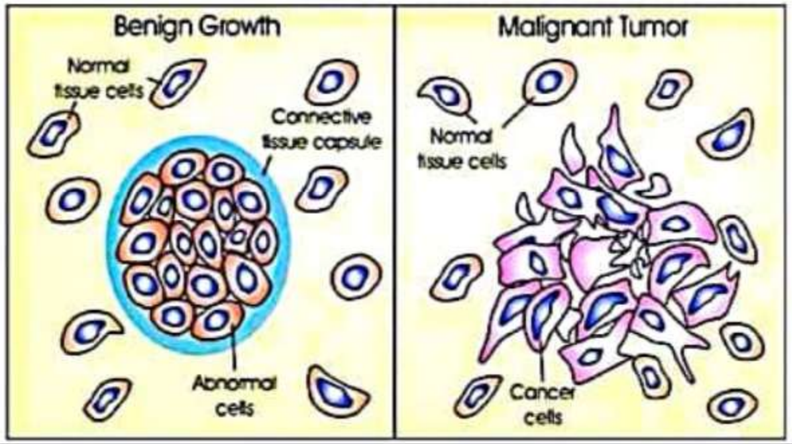


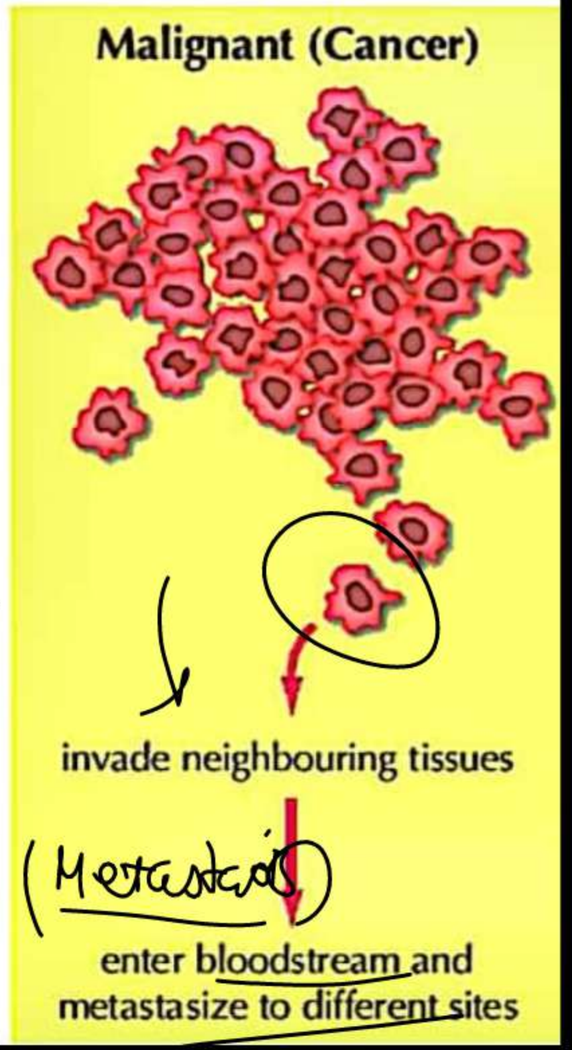
CANCER Types of tumours

2. Malignant tumours

- Mass of proliferating cells (neoplastic or tumor cells) that grow rapidly, invade and damage the surrounding normal tissues.
- Due to active division and growth, they starve normal cells by competing for nutrients.
- Cells sloughed from tumours reach other sites via blood where they form a new tumour. This is called metastasis.







CANCER Types of tumours

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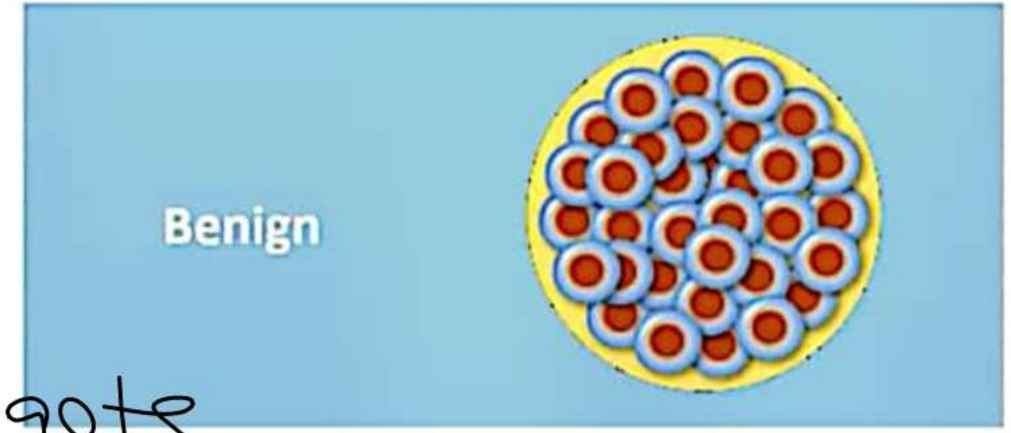
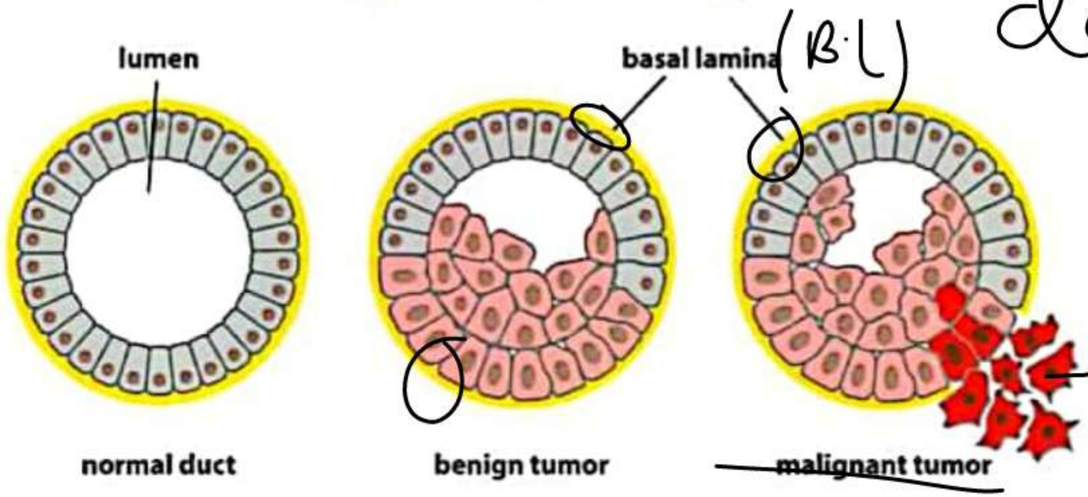


Benign v/s Malignant



B.L gets damage.

CANCER Types of tumours

2. Malignant tumours

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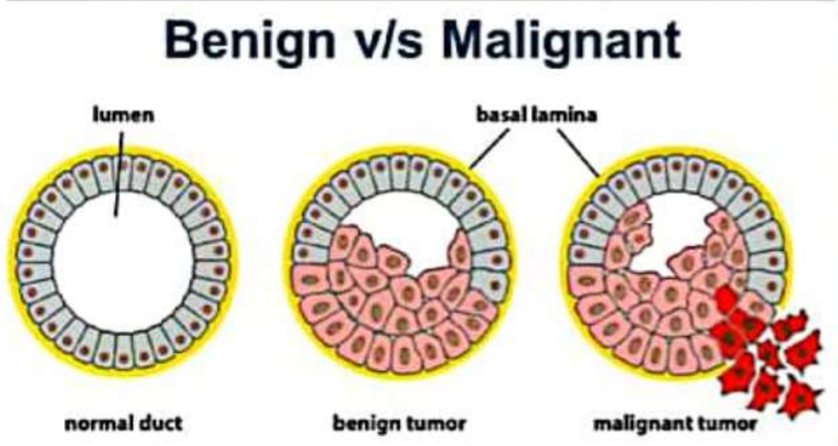
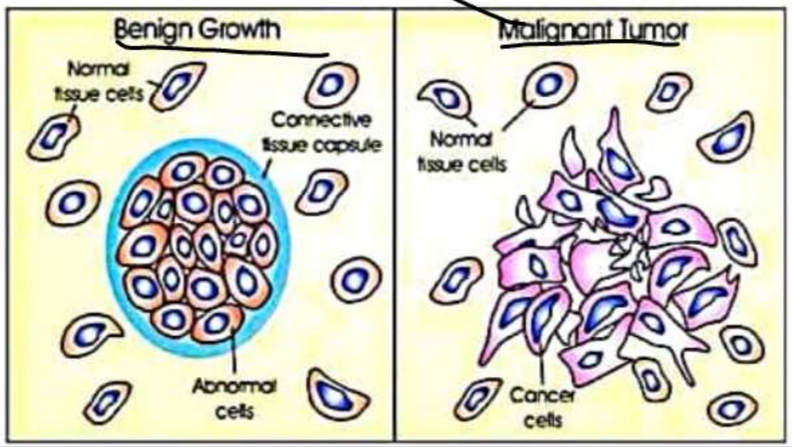
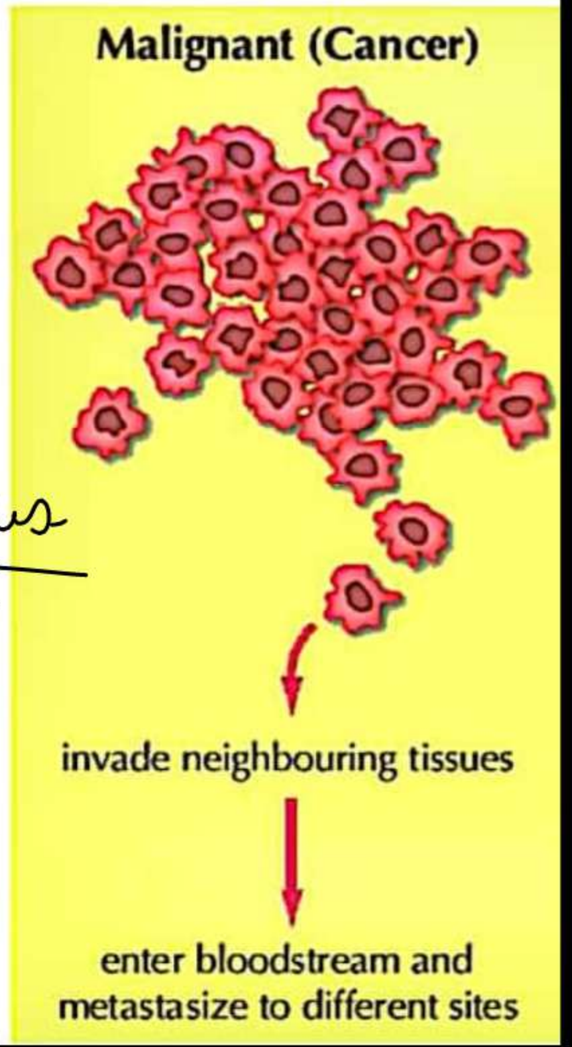
→ 100% cancerous





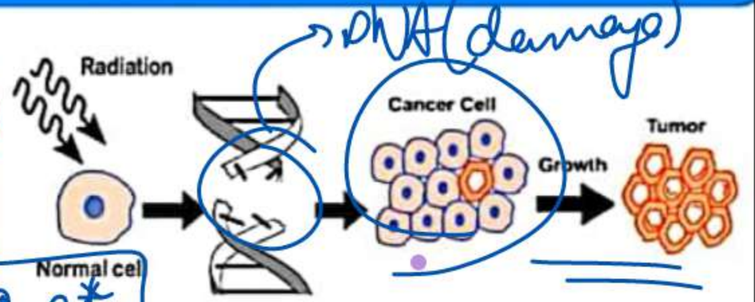


CANCER

Causes of cancer (Carcinogens)

Carcinogens (cancer causing agents)

- **Physical agents** — Ionizing radiations like X-rays and gamma rays and non-ionizing radiations like UV.



- **Chemical agents** — Tobacco smoke (major cause of lung cancer), vinyl chloride, caffeine, nicotine, mustard gas etc.

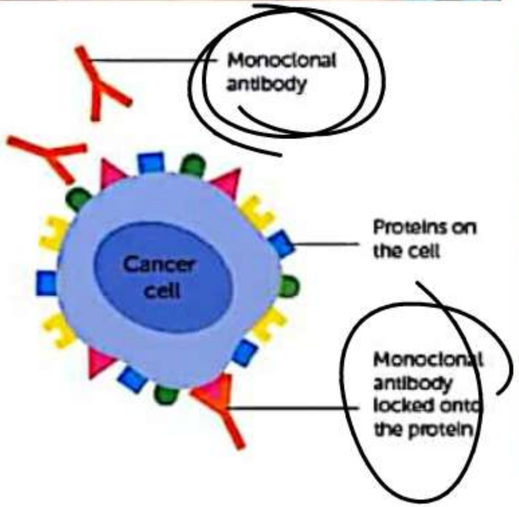
- **Biological agents** — Oncogenic viruses, cellular oncogenes (c-onc) or proto oncogenes etc. When C-onc in normal cells is activated, the

CANCER Cancer detection and diagnosis

↳-oma, -sarcoma, carcinoma.

Cancer detection & diagnosis

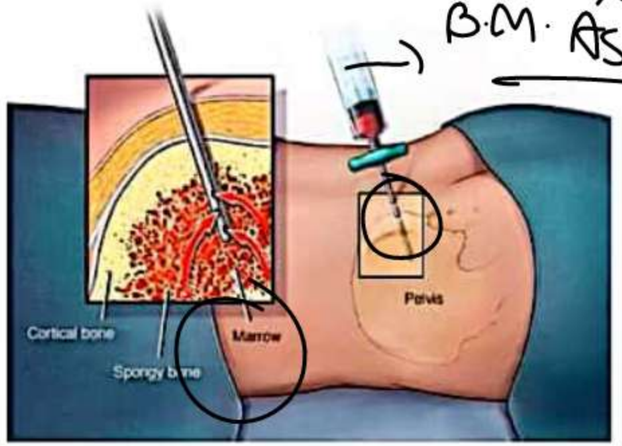
1. Biopsy
2. Imaging techniques
3. Use of antibodies
4. Molecular biology techniques



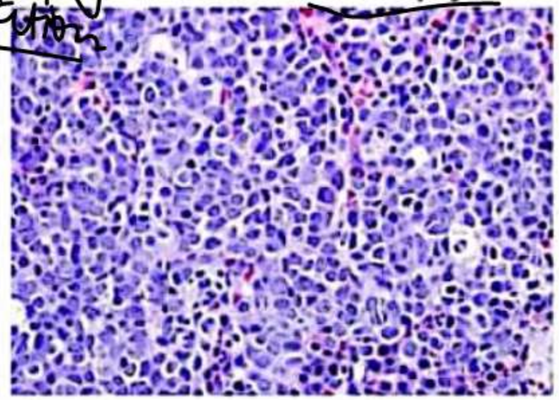
CANCER Cancer detection and diagnosis

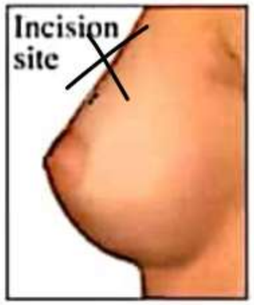
1. Biopsy

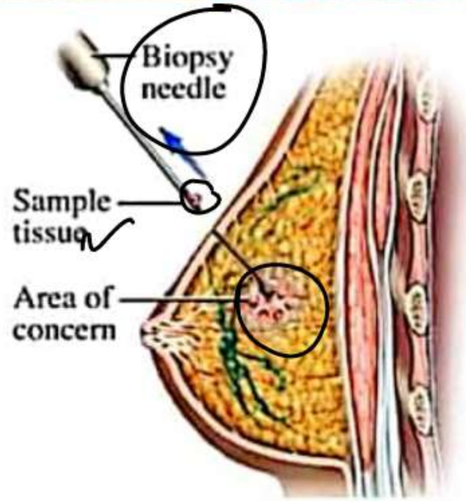
- A thin piece of the suspected tissue is stained and examined under microscope (histopathological studies). (∵ Histo : tissue)
- In case of leukemia: Biopsy and histopathological studies. Blood and bone marrow tests for increased cell counts.



B.M. Aspiration



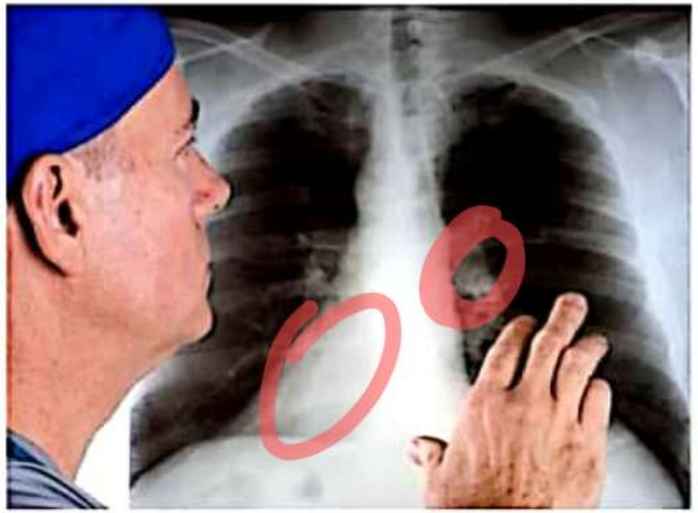


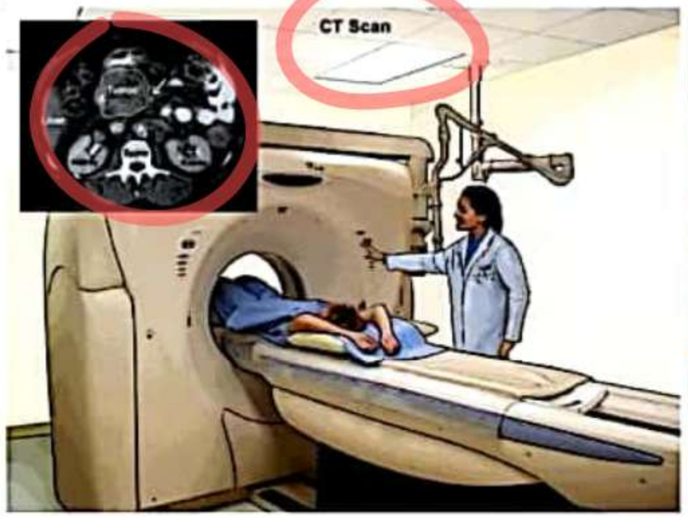


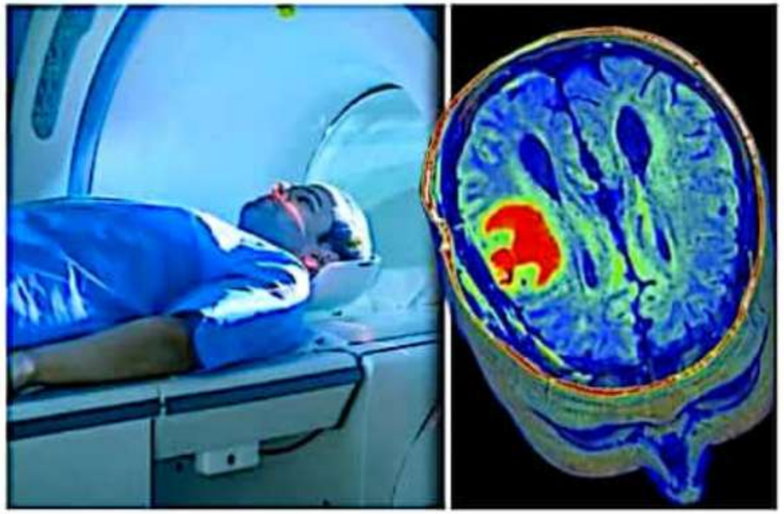
CANCER Cancer detection and diagnosis

2. Imaging techniques

- **Radiography: Use of X-rays.**
- **CT (Computerized tomography) scan: Uses X-rays to generate a 3D image of the internals of an object.**
- **MRI (Magnetic Resonance Imaging): Uses magnetic fields and non-ionising radiations to detect pathological and physiological changes in the living tissues**

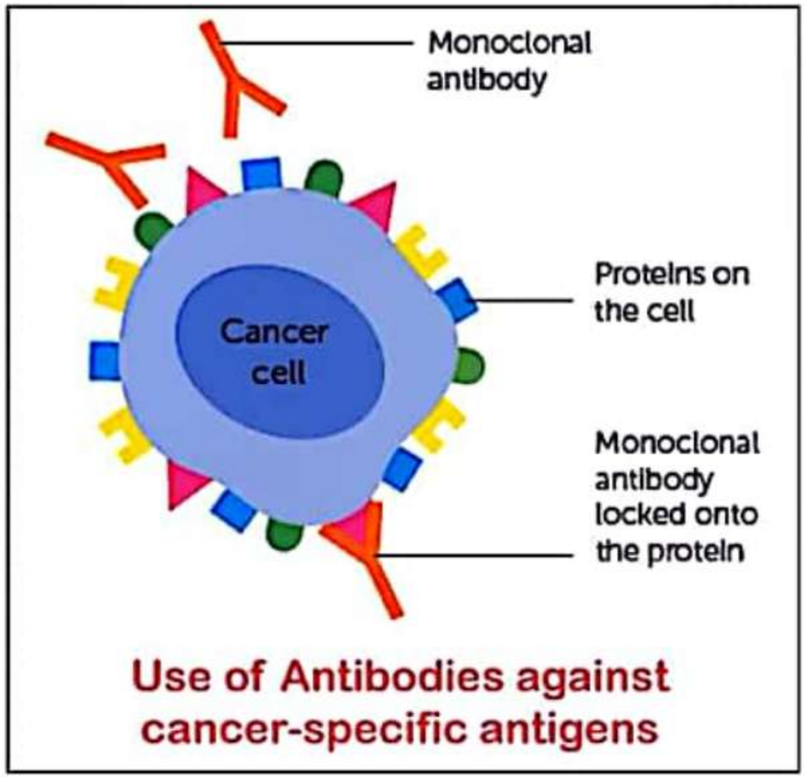




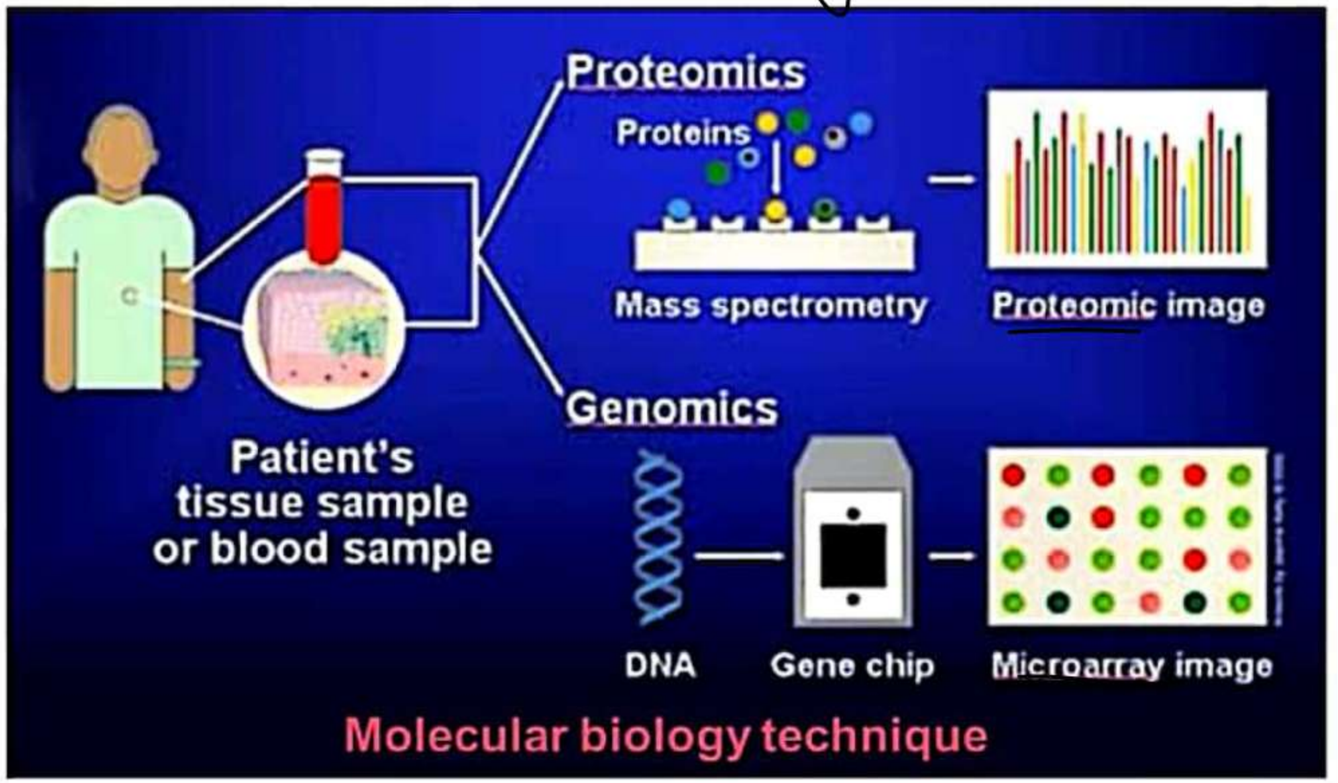


CANCER Cancer detection and diagnosis

3. **Use of Antibodies against cancer-specific antigens.** / Monoclonal Ab.
4. **Molecular biology technique: To detect cancer related genes. Such individuals should avoid carcinogens (e.g. tobacco smoke).** * ↳ oncogenes.



Use of Antibodies against cancer-specific antigens



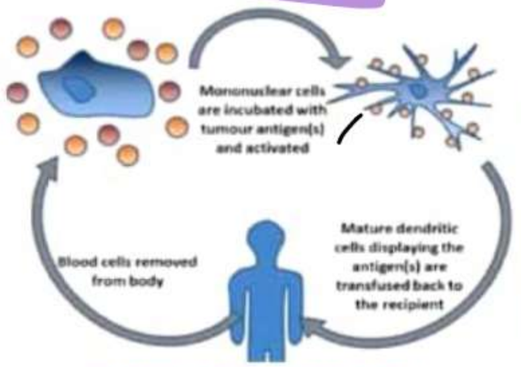
Molecular biology technique

CANCER Treatment of cancer

- **Radiotherapy:** Tumor cells are irradiated lethally, without damaging surrounding normal tissues.
- **Chemotherapy:** Use of chemotherapeutic drugs. Many drugs have side effects like hair loss, anaemia etc.
- **Immunotherapy:** The patients are given biological response modifiers (e.g. α-interferon) which activates their immune system and helps in destroying the tumor.
- **Surgery.**

RADIOTHERAPY

CHEMOTHERAPY



IMMUNOTHERAPY

SURGERY

Most cancers are treated by combination of surgery, radiotherapy & chemotherapy

Which of the following statement is not true for cancer cells in relation to mutations? [NEET-2016]

(A) Mutations destroy telomerase inhibitor

(B) Mutations inactivate the cell control

(C) Mutations inhibit production of telomerase

(D) Mutations in proto-oncogenes accelerate the cell cycle

Which one of the following statement is correct ? [AIMPT-2009]

(A) Patients, who have undergone surgery are given cannabinoids to relieve pain

(B) Benign tumours show the property of metastasis

(C) Heroin accelerates body functions

(D) Malignant tumours may exhibit metastasis

Which one of the following is not a property of cancerous cells, whereas the remaining three are?

[AIPMT-2012]

(A) They compete with normal cells for vital nutrients

(B) They do not remain confined in the area of formation

(C) They divide in an uncontrolled manner

(D) They show contact inhibition

Mark the incorrect ones

(i) Ionising radiations like x-rays and UV rays and non-ionizing radiation like gamma rays cause DNA damage leading to neoplastic transformation

(ii) CT scan uses non-ionizing radiations to accurately detect pathological and physiological changes in the living tissue.

(iii) Antibodies against cancer-specific antigents are also used for detection of certain cancers.

(iv) Some of the chemotherapeutic drugs are specific for certain cancers.

(A) (i), (ii) and (iii)
(B) (i) and (ii)
(C) (iii) and (iv)
(D) (ii) and (iv)

The cells of the malignant tumors exhibit

(A) Metastasis

(B) Contact inhibition

(C) High differentiation

(D) Slow proliferation

Which of the following statement is incorrect?

(A) MALT constitutes about 50% of the lymphoid tissue in human body

(B) The envelope of AIDS virus encloses RNA genome

(C) Cancer cells show the property of contact inhibition

(D) Chronic use of drugs and alcohol can damage nervous system and liver.

A cell:

i. **Loses the property of contact inhibition**

ii. **Shows uncontrolled proliferation** (growth)

iii. **Invades the neighboring tissues**

This cell is probably : → Metastasis

(A) Mutated

(B) Cancerous

(C) Dedifferentiated

(D) Apoptotic

Which of the following statement is not true for cancer cells in relation to mutations? [NEET-2016]

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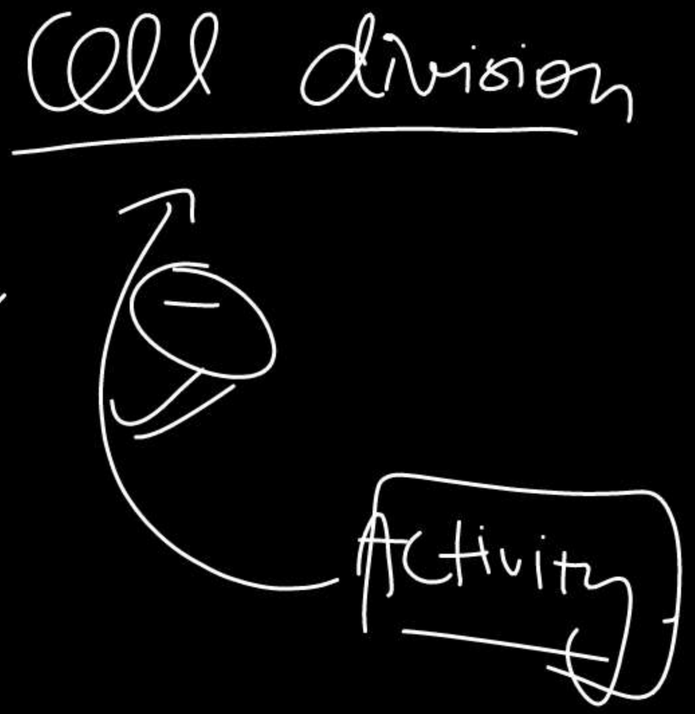


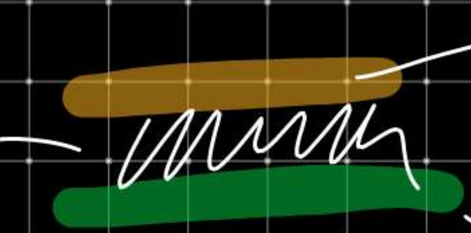
① Oncology: Study of cancer

→ Oncologist: *

② Neoplasia: "Tumor"

→ Mainly Malignant tumors

(3) Basal Lamina:



epithelium

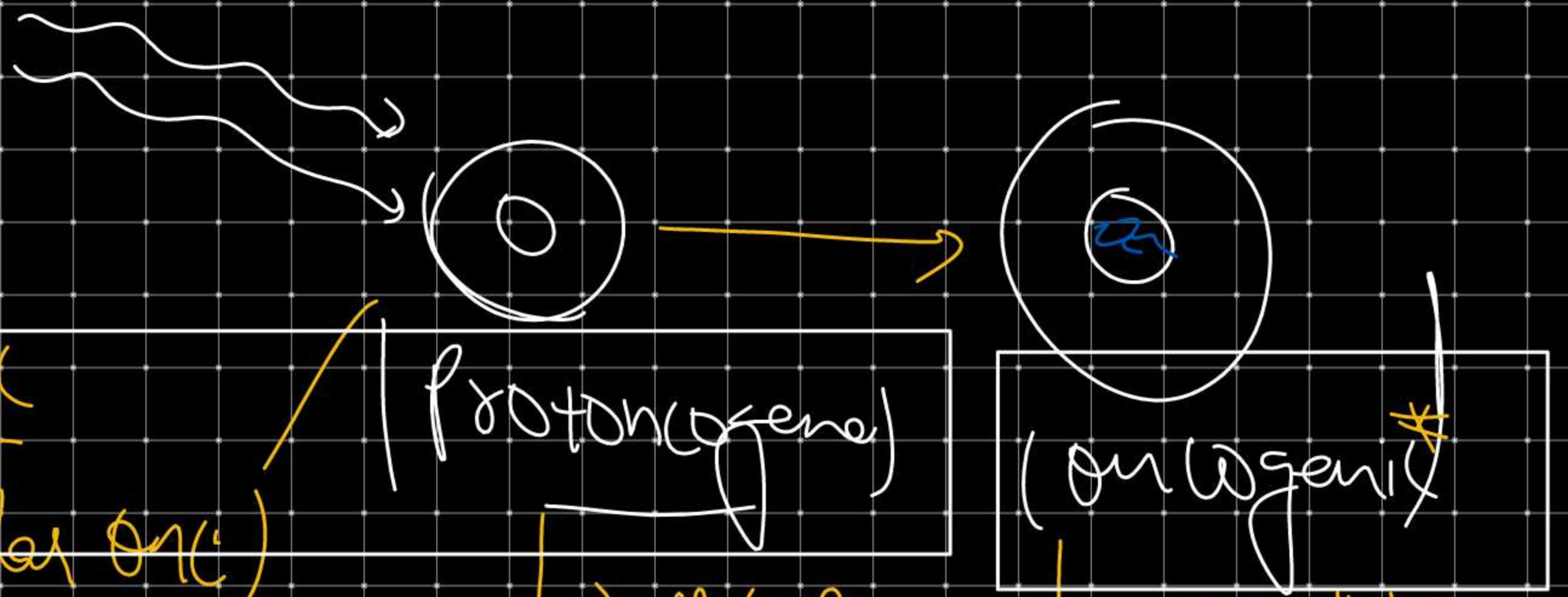
connective tissue

Boundary:
which keeps the cell bounded.

Basal Lamina
(epithelial + connective)

Benign T.	Malignant T. (Dangerous)
1. Localised (origin → growth)	1. Sloughing nt (origin ≠ growth)
2. Metastasis -ht	2. Metastasis is the Most fearful Prop. of M.T.

⑦ Oncogenic Transformation



c-onc / (cellular onc)

↳ all cells.
↳ Not Cancerous.

↳ not found in normal cell
↳ found in cancer cells.

(5) Oncogenic virus: a) HPV (Human Papilloma Virus)

↓

Cervical cancer.

b) Herpes virus (HHV-8)

↳ Kaposi's sarcoma.