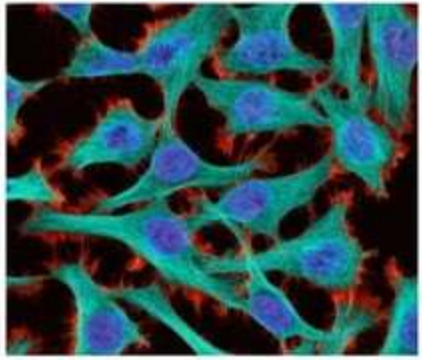
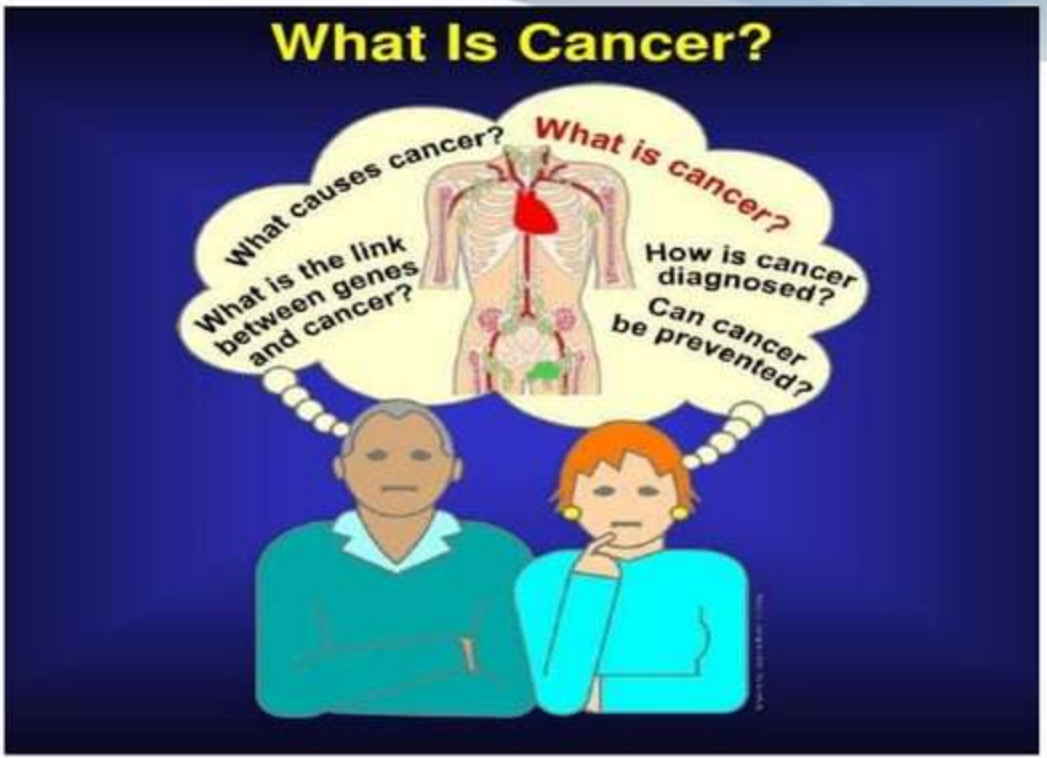
CARCINOGENESIS



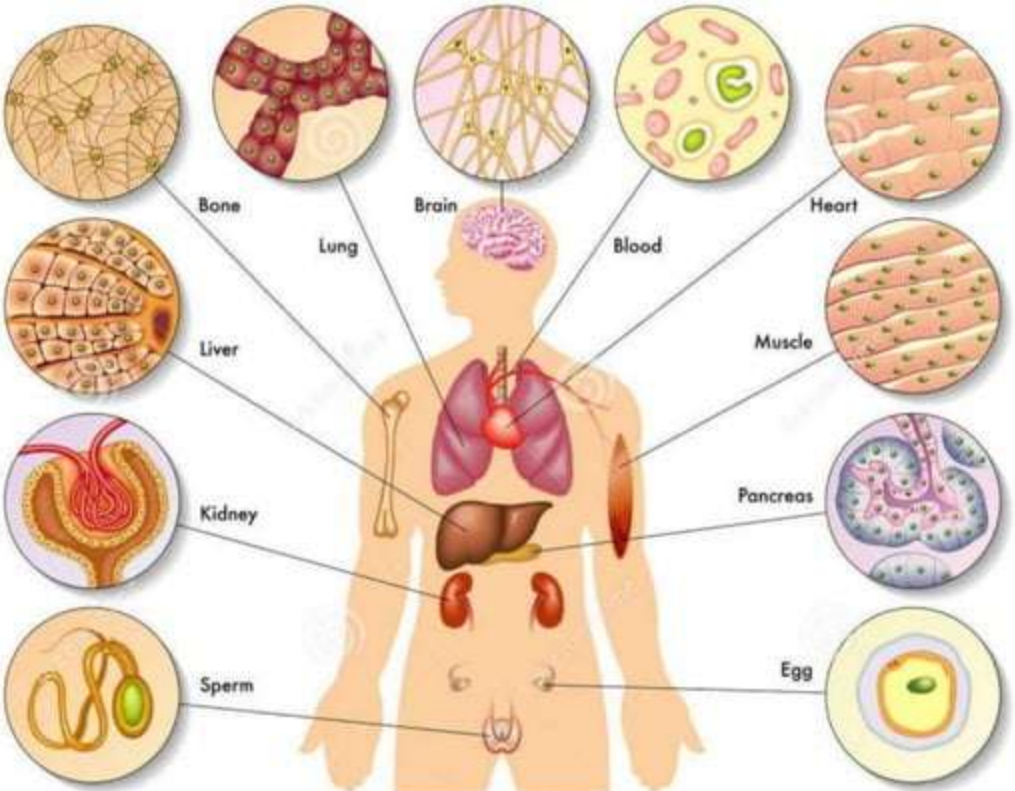
SAHEED OLUWASINA OSENI (DVM)

DEPARTMENT OF BIOLOGICAL SCIENCES


What Is Cancer?
What causes cancer?
What is cancer?
What is the link between genes and cancer?
How is cancer diagnosed?
Can cancer be prevented?

OVERVIEW

- What is cancer? Mutation?
- What is carcinogenesis?
- Stages of Carcinogenesis


Bone
Lung
Brain
Blood
Heart
Liver
Muscle
Kidney
Pancreas
Sperm
Egg

SO WHAT IS CANCER??

CANCER is a group of related diseases, characterized by abnormal uncontrolled cellular growth and invasive cell proliferation.

NB: There is a difference between Benign and Malignant (Cancer) tumor.

MUTATIONS

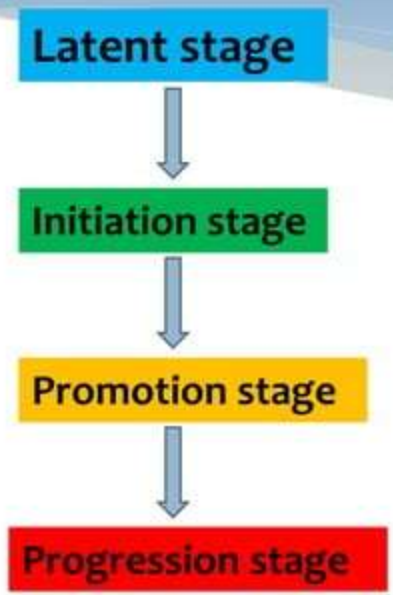
A cancer cell is a cell that grows out of control due to mutations that cause uncontrolled cell growth.

Mutations are changes in DNA structure.

WHAT IS CARCINOGENESIS?

- **Multi-stage**
- **Multi-factorial**
- **Genes – multiple genes**
- **Epigenetic factors**

Carcinogenesis is a multistage process involving;



Latent period:

- Usually lapse up to 20 years or more, between the initiating insult and the appearance of a clinically detectable tumor.

- During the latent period cellular proliferation occurs, limited by host defenses and/or lack of access to the host's blood supply.

INITIATION STAGE

- Can occur after a single exposure to chemical or physical carcinogen;
- Involves genetic mutation;
- Appears irreversible;
- Is heritable within the cell population because the initiated cell conveys the malignant alteration to its daughter cells.

PROMOTION STAGE

- It is a slow and gradual process; usually takes years
- Requires a more prolonged exposure to carcinogenic agent.
- It is partially irreversible
- can be arrested by certain anti-carcinogenic agents

NB: Most promoting agents are MITOGENS for the

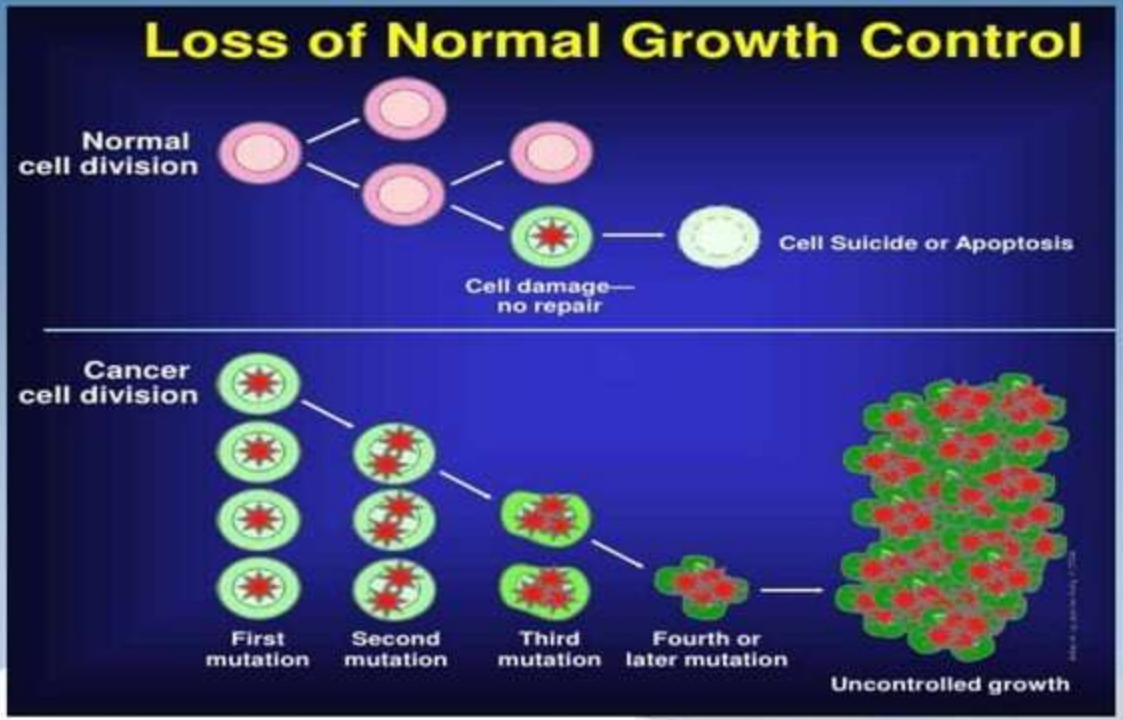
PROGRESSION STAGE

- Requires continuous clonal proliferation of altered cells, during which a loss of growth control and an escape from host defense mechanisms become prominent phenotypic traits.
- Allows progressive growth to clinically detectable tumor.
- It is irreversible due to pronounced changes in the genome.

NOTE:

The progression stage of carcinogenesis is an extension of the tumor promotion stage, and results from it in the sense that the cell proliferation caused by promoting agents allows the cellular damage inflicted by initiation to be propagated, and the initiated cells are clonally expanded.....

SUMMARY



Multiple mutations are required before a normal cell can become a cancer cell


Thank You!