CONCEPT: OVERVIEW OF CANCER

● **Cancer** is a disease which is primarily caused from misregulated cell division, which form _____

□ There are two types of tumors

- **Benign** tumors remain confined to its original location

- **Malignant** tumors invade surrounding tissues and spread throughout the body (*metastasis)*

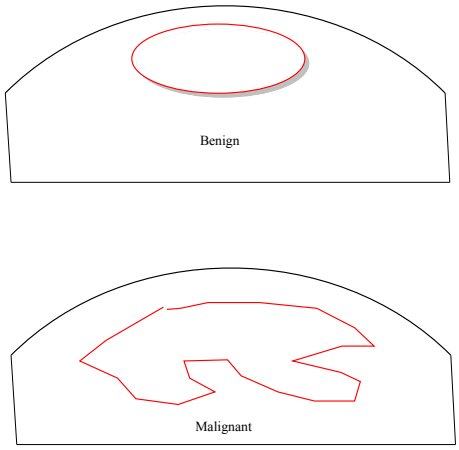
□ There are three main _____ of cancers

- *Carcinomas* are cancers of epithelial cells (90%)

- *Leukemias/lymphomas* are cancers of blood and immune system (7%)

- *Sarcomas* are cancers of connective tissue (very rare)

EXAMPLE:



● Cancer is caused by many _____

□ **Carcinogens** are substances that cause cancer (Ex: tobacco associated with 30% of all cancers)

- *Epidemiology* is a field which studies diseases in human populations – identifies carcinogens

□ Cancer is not caused by a single mutation, but a number of mutations

- **Tumor initiation** is when a genetic alteration leads to abnormal cell proliferation and replication

- **Tumor progression** occurs as the tumor cells gain more mutations

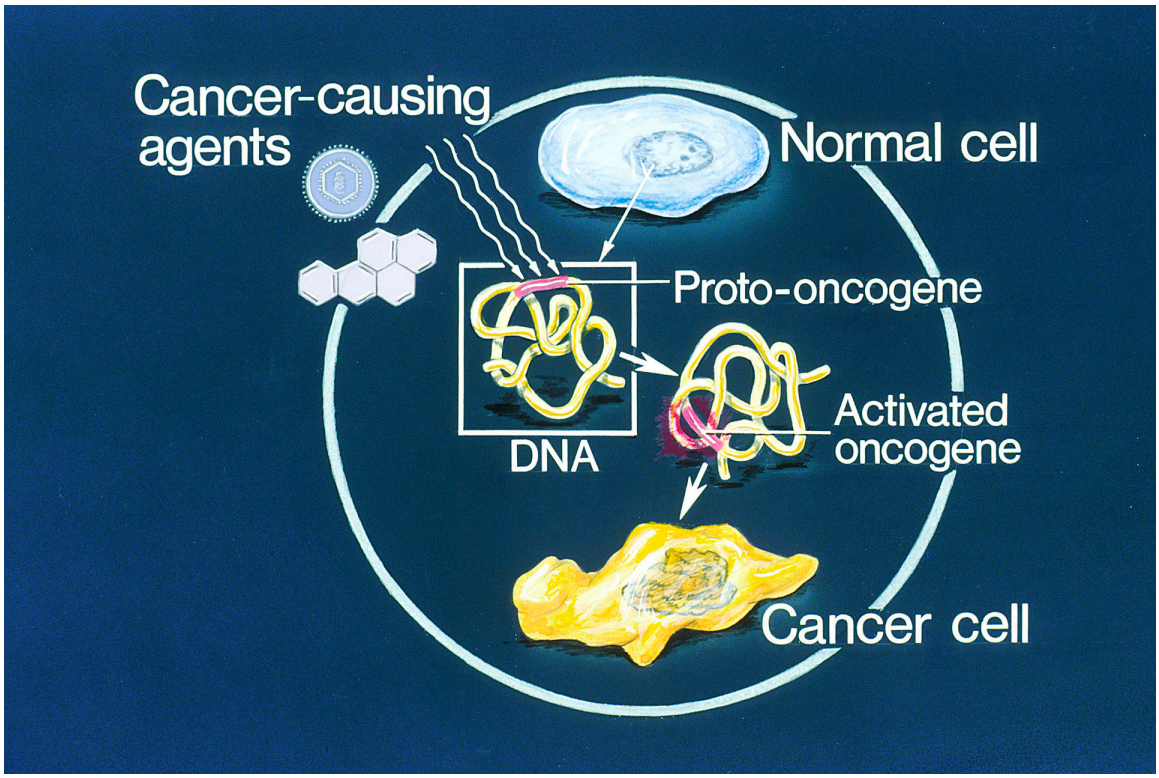
□ Mutations are found within two _____ of genes

- **Oncogenes** are genes that when mutated cause cell growth

    - *Proto-oncogenes* can easily become an oncogene through additional mutations

- **Tumor suppressors** are genes that normally suppress cell growth

EXAMPLE:



● Tumor cells present with certain _____

□ They are **genetically unstable** because they accumulate mutations at a rapid rate

□ They lose *contact inhibition* which is a trait cells have to tell them to stop dividing when touching other cells

- Also called anchorage-independent growth

□ They undergo *angiogenesis* which allows them to form new blood vessels within the tumor

□ They have defects in apoptosis pathways

PRACTICE:

1. Which of the following is not a characteristic of tumor cells?
    a. Undergo angiogenesis
    b. Are genetically unstable
    c. Perfectly control apoptosis
    d. Loose contact inhibition

2. Which of the following genes normally suppress tumor growth, but when mutated allow for tumor growth?
    a. Carcinogens
    b. Oncogene
    c. Tumor suppressors
    d. Proto-oncogenes