

NAME: OJAMERUAYE OGHENEFEJIRO

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COURSE: BIOCHEMISTRY

DEPARTMENT: MEDICINE AND SURGERY

ASSIGNMENT

- 1) WHAT DO YOU UNDERSTAND BY PRIMARY OR SIMPLE OBESITY.
- 2) HOW DOES CONGENITAL SYNDROME AND DRUG THERAPY AFFECTS OBESITY.
- 3) OUTLINE THE AETIOLOGY OF CANCER AND ITS MOLECULAR BASIS.

ANSWERS

- 1) PRIMARY OR SIMPLE OBESITY

Primary or simple obesity is a type of obesity that is not caused by a medical condition i.e. it is not associated with a prior medical condition. No obvious cause exists other than an imbalance in energy intake and expenditure.

- 2) HOW CONGENITAL SYNDROME AND DRUG THERAPY AFFECTS OBESITY

Congenital Syndrome

Congenital syndromes are also called congenital disorders. A congenital syndrome is one that occurs on or before birth. Secondary obesity is usually due to a congenital disorder which causes a person to gain weight. Various congenital syndromes associated with obesity are: Prader-Willi syndrome, Bardet-Biedl syndrome, Cohen syndrome, Albright hereditary osteodystrophy, and Borjeson-Forssman-Lehmann syndrome as well as some rarer disorders.

Drug Therapy

The administration of certain medications may cause weight gain or changes in body composition. These include insulin, sulfonylureas, thiazolidinediones, atypical antipsychotics, antidepressants, steroids, certain anticonvulsants (phenytoin and valproate), pizotifen, and some forms of hormonal contraception.

- 3) AETIOLOGY OF CANCER AND ITS MOLECULAR BASIS

Aetiology

The aetiology of cancer is multifactorial that is-it can be caused genetic, hormonal, metabolic, physical, chemical and environmental factors. These factors cause a mutation of genes during replication which results in cancer. Most human cancers are spontaneous. All cancers originate usually from one aberrant cell, which goes on to multiply and produce a tumour mass. The immune system helps in destruction of these aberrant cells. As age advances, the number of mutations accumulate, hence the statistical probability of the

incidence of cancer is increased. Agents which can induce cancer are called carcinogens. Mutagens are any substance which increases the rate of mutation and can also enhance the rate of incidence of cancer. Therefore, all carcinogens are mutagens. About 50% of human cancer is due to mutation or deletion of repair genes known as ANTIONCOGENES.

Molecular Basis

Normally, normal cells replicate, and dead ones are removed from the system by apoptosis (programmed cell death). This is due to the shortening of the telomeres or chromosomes of the cell. Telomeres are nucleoprotein complexes that cap the ends of chromosomes and maintain their integrity. In normal tissue, telomere shortening (which occurs with aging) results in a finite limit in cell division.

The molecular basis of cancer is seen in the fact that cancer cells are able to escape apoptosis of the normal cell cycle leading to their immortalization. Immortalisation is an essential step in the malignant transformation of normal cells and can be attributed, in part, to the presence of telomerase, the enzyme responsible for maintaining telomeres at the ends of chromosomes. By extending telomeric DNA, telomerase is able to counter the progressive telomere shortening that would otherwise lead to cell death. Unlike normal cells that lack detectable levels of telomerase activity, approximately 90% of human tumours consist of cells that contain an active telomerase enzyme.