Prof ANIL KUMAR Zoology
B.Sc HONS Part-III Paper V

Topic :- Give an account of chemical nature and Physiolog
action of the hormone secreted by

a. Thyroid
b Islet of Langerhans
c. Testis
d ovary

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Q. Give an account of chemical nature and physiological action of the hormone secreted by (a) Thyroid (b) Islet of Langerhans (c) Testis (d) Ovary.

Ans. (a) Thyroid gland secretes thyroxine harmones chemical nature of thyroxine :

It is found in the form of protein thyroglobulin. Thyroxine has got a very potent hormone activity. Anolher iodine compounds 3,5,3 tri-iodo thyromine is more poten and acts more rapidly than thyroxine in many of it effects. Recently 3,3,5 tri-iodo thyromine and 3, 3 di-iodo thyromine have been found to be thyroid and hormonal activity is there in these compounds.

Physiological action :

1. Growth and Morphogenesis : Thyroidectomy in the young ones of all vertebrate arrest growth development.

2. Bajal Metabolic Rate : It control BMR by the kir of its hormones.

3. It helps, carbohydrate, protein and fat metabolism.

(b) Islet of Langerhans : It secrets insulin glucose.

Chemical Nature of Insulin :

It is peptide hormones. It is in cystalin form and also demonstrated its protein nature.

Chemical structure of insulin consists of 51 amino acid residues dispersed in two chains. Then this polypeptide chain are held together by croms linkage. of two disulfide bonds. It has a molecular weight of 33 and is iso-electric at pH 5.4.

Physiological Action :

(i) Insulin has a profound influence on carbohydrate metabolism.

(ii) It influences inorganic metabolism.

(iii) It promotes anobolic process.

(c) Testis :

It secretes many hormones with androgenic activity. The three importants are :

(i) Testosterone $C_{10}H_{28}O_2$

(ii) Androsterone $C_{19}H_{30}O_2$

(iii) Dehydroprian drosterone $C_{18}H_{25}O_2$

Chemical nature : Chemically there are derivating of C_{19} hydrocarbon, androstrone. Testosterone is most potent of all these and dehydro epiandrosterone is least active. In addition to testosterone, androsterone and Dehydroeprian drosterone are also synthesized in the testis, although in amongst far lay than that of testosterone.

Physiological action : (i) It is mainly responsible for the development of secondary sexual characters in the mains.

(ii) It promotes the growth and function of epididymis.

(iii) It helps in nitrogen retention.

(d) Ovary : It secretes Estrogen, B-estradial, Estrial and Estrone. The three compounds of this group which hormonal activity are :

(i) B-istradiol $C_{13}H_{24}O_2$

(ii) Estriol $C_{18}H_{24}O_3$

(iii) Estrone $C_{18}H_{23}O_2$

3. Chemical Nature : Chemically the istrogen are derivates of a C_{18} hydrocarbon estrone. All these are characterized by the absence of a CH_3 group at carbon 10 and by the aromatic nature of ring A, making the OH group phenolic character of all these B-estradiol is most potent physiologically, estrone less potent and estroil is least action.

Physiological Action :

(i) It stimulates growth of Auxillary and public hairs.

(ii) Proliferates mammary gland.

(iii) It promotes growth of uterus and vagina.

(iv) Widening of pelvics.