

Hormonal theory for sex determination

- The theory of sex chromosome and genic balance successfully apply to the lower animals but in higher vertebrates and under certain conditions in invertebrates, the embryo develops some characters of the opposite sex together with the characters of its own sex chromosome.
- It means, the sex changes under specific circumstances.
- This is due to the hormones secreted by the gonads of that animal.
- The theory is based upon the observations of Crew in chicks.
- He found that a hen which laid fertile eggs, accidentally lost its ovary, stopped laying eggs and developed male comb, male plumage and became a cock.
- It finally functioned as male and became father of two chicks.
- There are several examples of hormonal control of sex differentiation. Some are follows -

① Sex reversal - the above example of chicken is sex-reversal example.

→ Sometimes the ovary was removed or destroyed the ovarian hormones stopped and after some time the dormant testes present in rudiment in almost all the female birds started functioning.

→ The hormone (male) started produced and resulted in the appearance of male secondary sexual characters and formation of sperm.

→ Cases of sex reversal have been observed in fishes, amphibians birds and even in mammals.

→ The artificial removal of gonads of either sex before puberty in mammals and even in man, results in the development of secondary sexual characters of the opposite sex.

Free martinism, another example of early sex determination influenced by hormones on often found in cattle.

Lillie and others found that where twins of opposite sex (one male and one female) are born, the male is normal but female is sterile with many male characteristics.

Such sterile female is known as free martin.

In cattle, the foetal membrane of the twins are fused in such a manner that they have a common circulation of blood.

The female hormone is produced at a slightly later stage in the development and guides its development towards female side.

The male hormone, which is produced slightly in advance of female hormone enters the body of female twin and before the female hormone affects the development of female characteristics.



It is already differentiated in the guidance of male hormone. As a result the developing female is sterile.