

EMBRYONIC BISEXUALITY

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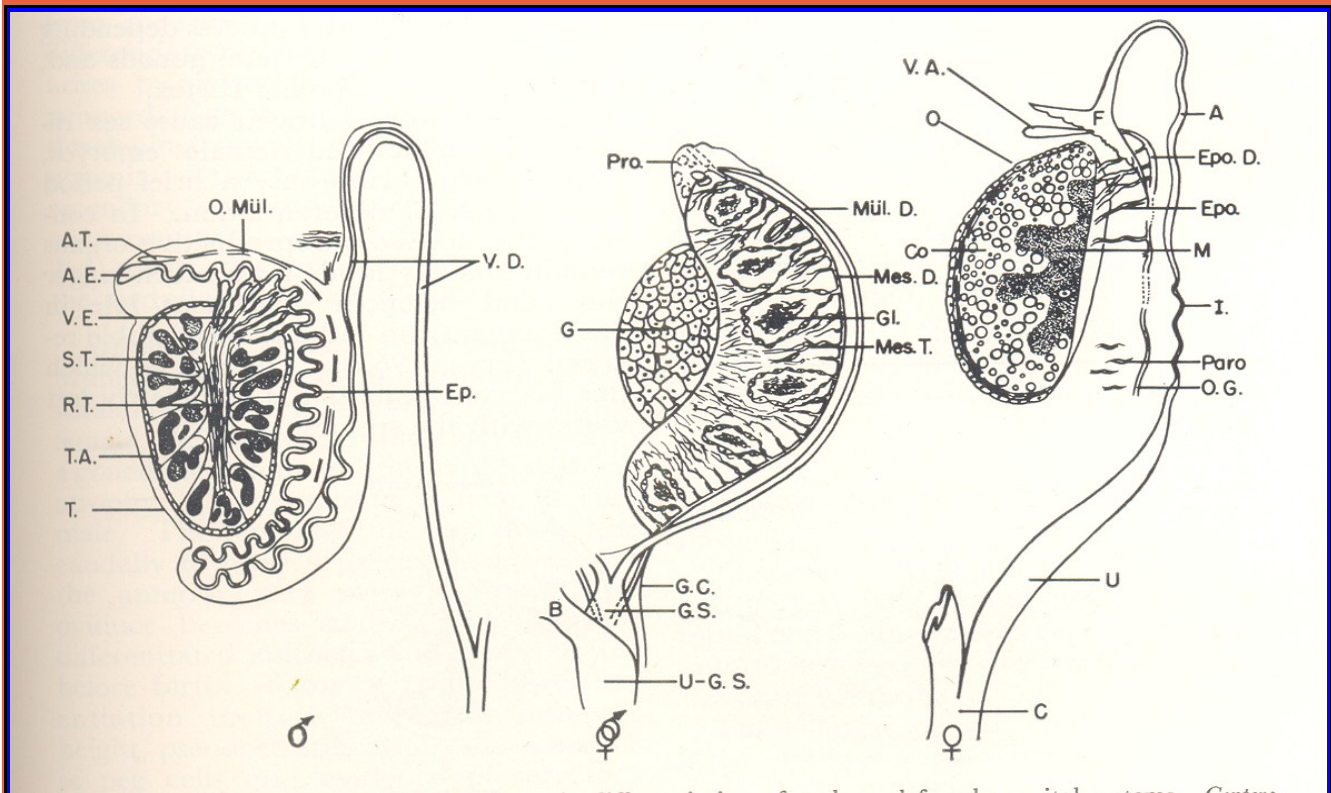
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Rudimentary reproductive system of mammal:

The rudimentary reproductive system of mammal consists of :

- * Two sexually undifferentiated gonads
- * A genital tubercle
- * A urogenital sinus
- * Two pairs of ducts
- * Vestibular folds



Embryonic differentiation of male and female genital systems

<i>A</i> Ampulla	<i>G. C.</i> Genital cord	<i>Paro</i> Paroophoron
<i>A.E.</i> Appendage of epididymis	<i>Gl.</i> Glomerulus	<i>Pro.</i> Pronephros
<i>A.T.</i> Appendage of testis	<i>G.S.</i> Genital sinus	<i>R.T.</i> Rete tubules
<i>B</i> Bladder	<i>I.</i> Isthmus	<i>S.T.</i> Seminiferous tubules
<i>C</i> Cervix	<i>M</i> Ovarian medulla	<i>T.</i> Testis
<i>Co</i> Ovarian cortex	<i>Mes. D.</i> Mesonephric duct	<i>T.A.</i> Testicle artery
<i>Ep.</i> Epididymis	<i>Mes. T.</i> Mesonephric tubules	<i>U</i> Uterus
<i>Epo.</i> Epoophoron	<i>Mul. D.</i> Müllerian duct	<i>U-G.S</i> Urogenital sinus
<i>Epo. D.</i> Duct of epoophoron	<i>O</i> Ovary	<i>V.A.</i> Vesicular appendage
<i>F</i> Fimbriae	<i>O.G.</i> Obliterated Gartner's duct	<i>V.D.</i> Vas deferens
<i>G</i> Gonad (undifferentiated)	<i>O. Mül.</i> Obliterated Müllerian duct	<i>V.E.</i> Vasa efferentia

The rudimentary system primarily arises from two germinal ridges on the dorsal side of the abdominal cavity and can potentially differentiate into a male or female system.

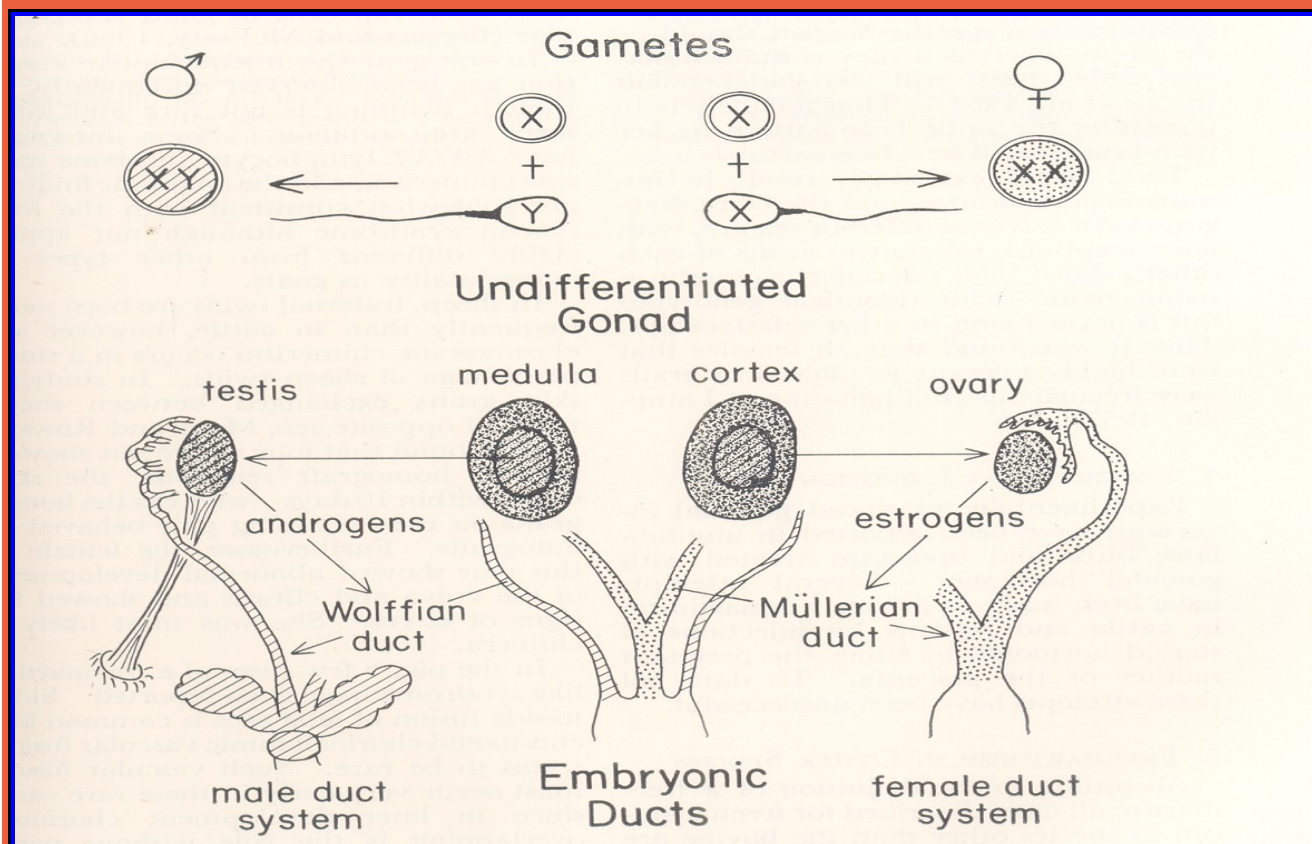
The sex of an animal depends on three distinct but related factors :

1. Inherited genes
2. Gonadogenesis
3. The formation and maturation of accessory reproductive organs

The developmental fate of the sexual rudiments in the male and female foetus is as follows :

Sexual rudiment	Male	Female
Gonad : Cortex Medulla	Regresses Testis	Ovary Regresses
Mullerian ducts	Vestiges	Uterus, oviducts, parts of vagina
Wolffian ducts	Epididymis Vas deferens	Vestiges
Urogenital sinus	Urethra, prostate, bulbourethral glands	Part of vagina, urethra
Genital tubercle (Phallus)	Penis	Clitoris
Vestibular folds	Scrotum	Labia

Sex determination :



Determination of sex in mammals

Inter sexuality in farm animals :

Syndrome	Sex chromosomes*	Gonad	Reproductive tract	External genitalia
Freemartin	XX /XY	Masculinized ovary	Both male and female	Female
True hermaphrodite	XX /XY XX /XY	Ovary and testis or Ovo-testis	Both male and female	Both male and female
Male pseudohermaphrodite	XY XX	Testis	Both male and female	Female
Female pseudohermaphrodite	XX	Ovary	Both male and female	Male

Congenital anomaly :

White heifer disease :

A classic congenital anomaly associated with the gene for white coat colour is the white heifer disease in cattle, in which :

- * The prenatal development of the Mullerian ducts is arrested and
- * The vaginal canal is obstructed by the presence of an abnormally developed hymen.

This syndrome is expressed in different degrees depending upon the time when prenatal development is arrested. The degree and area of hypoplasia differ so that varying anomalies of the oviducts, uterus, cervix and vagina are formed.

This congenital anomaly can be differentiated from the Freemartin syndrome by the presence of :

- * Normal ovaries and
- * Normal structural vulva and labia in the foramen.

Other congenital defects of the female reproductive systems are :

- * Adhesion of vulva and vagina
- * Rectovaginal constriction
- * Uterus unicornis
- * Uterus didelphys
- * Double cervix
- * Ovarian aplasia
- * Ovarian hypoplasia etc.

Sugessted reading :

Reproduction in Farm Animals. 3rd and 5th Editions. E.S.E. Hafez