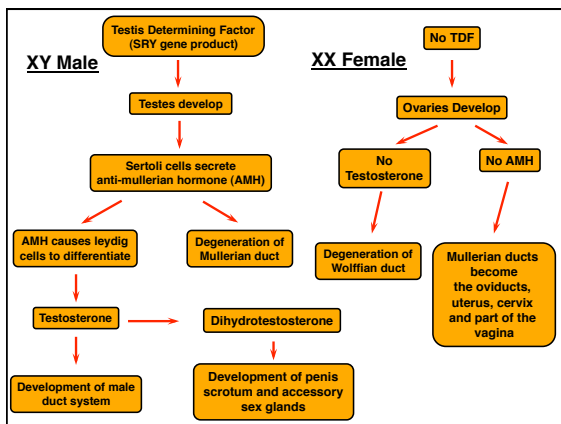
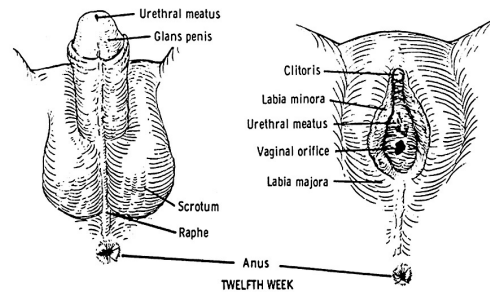
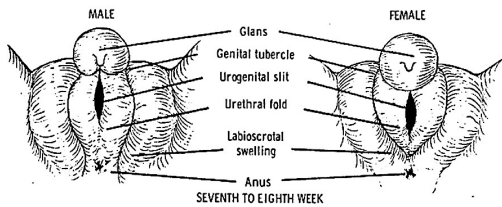
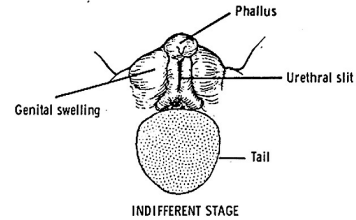


Significance of DHT

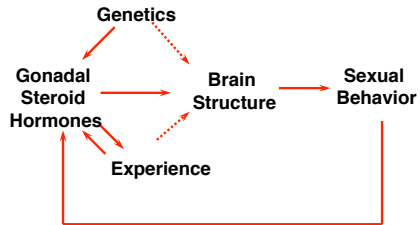
- Androgen receptor has a higher affinity for DHT
- Can get effects with low levels of circulating testosterone
- Secondary sex characteristic tissue in the male expresses 5 α -reductase

External Genitalia Differentiation



Brain or Behavioral Sex

Brain and Behavioral Sex Differentiation

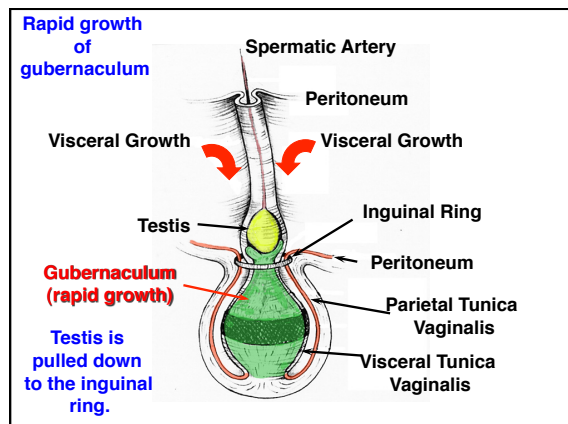
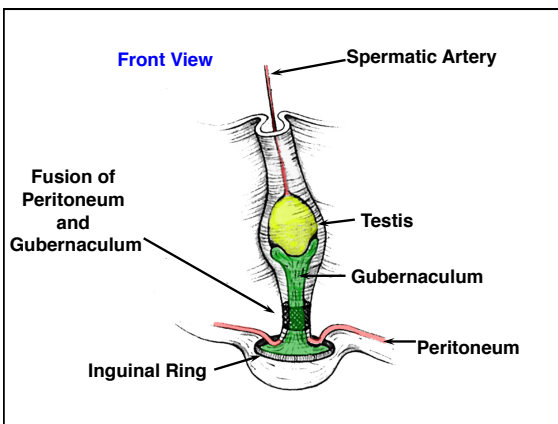
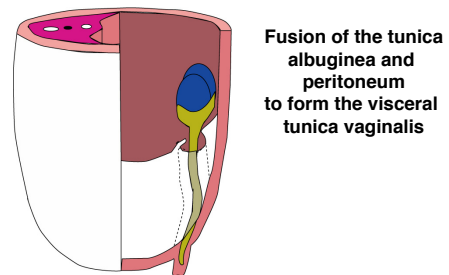


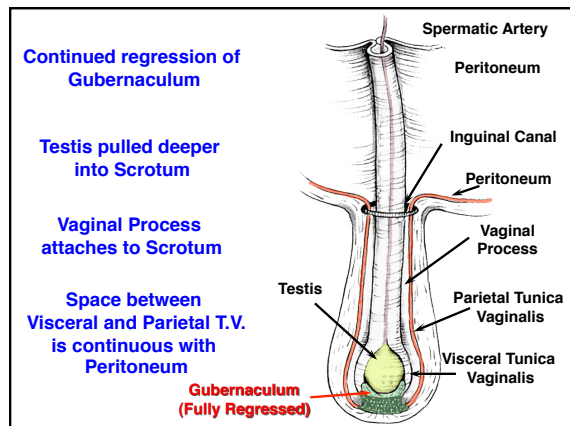
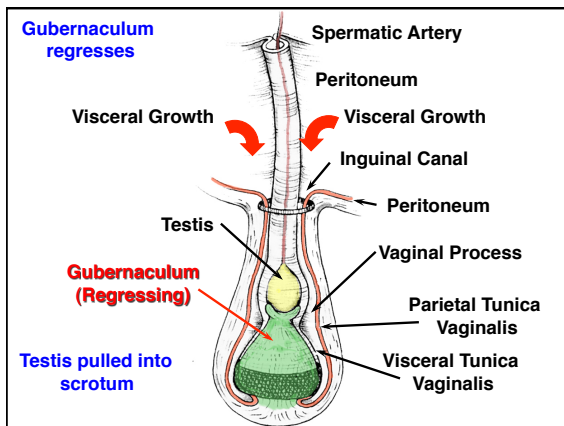
Brain Sexual Differentiation

- Rat female
 - » Give testosterone shortly after birth
 - fail to copulate or cycle like female as adult
- Sexually dimorphic nucleus
- Human male and female differences in behaviors
 - » aggression
 - » childhood play
 - » 3D visual rotation

Descent of the Testis into the Scrotum

Testicular Descent





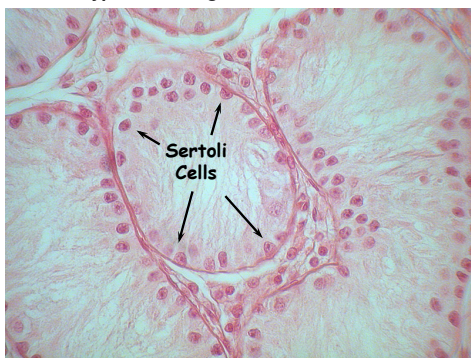
Failure or Problems With Testicular Descent

- **Cryptorchid - highly heritable**
 - » Unilateral or bilateral
 - Germ cells fail to multiply and then die, sertoli cells only in seminiferous tubules
 - » High percentage develop testicular cancer
 - » Surgical correction possible but does not reduce cancer risk

Normal Dog Seminiferous Tubule

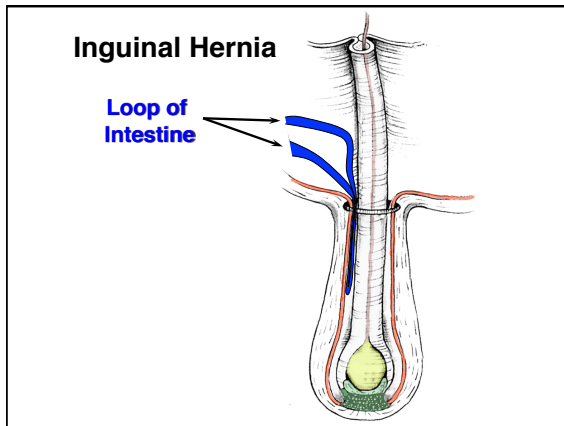


Cryptorchid Dog Seminiferous Tubule



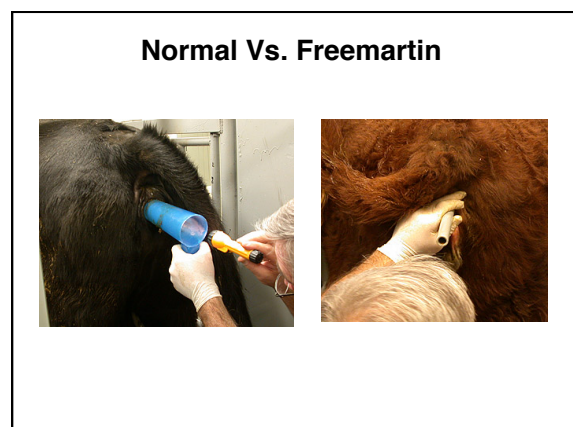
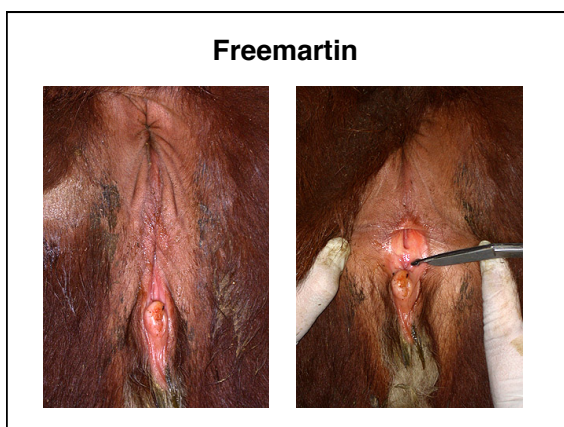
Failure or Problems With Testicular Descent

- **Cryptorchid - highly heritable**
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 - High percentage develop testicular cancer
 - Surgical correction possible but does not reduce cancer risk
- **Inguinal Hernia**



The Freemartin in Cattle

- Female born twin to a bull
- Placenta membranes of the 2 fetuses fuse
- Common blood supply
 - » At time of testis formation
 - » Before ovarian formation
- Both fetuses share a common hormone milieu
 - » testosterone
 - » anti-mullerian hormone
- Animals are chimeric (WBC from other twin)
 - » TDF (SRY) expressed in both individuals



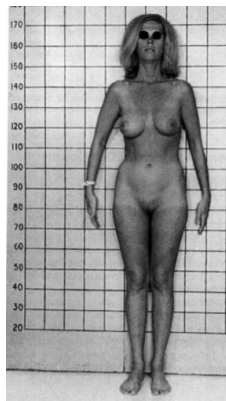
Freemartin

- AMH from bull - blocks Mullerian ducts
 - » Posterior vagina, no anterior vagina
- Testosterone from bull
 - » clitoral enlargement
 - » Brain changes like that of male
- Ovaries do not grow but are chimeric
 - » Ootestis
 - SRY and therefore AMH and Testosterone
 - Further changes and adult male behavior
- Use as estrus detector
- Abnormalities exist as a continuum

Testicular Feminization in an XY Individual

- No androgen receptor
- Testis
- No testosterone response so no Wolffian duct development
- AMH present so mullerian ducts regress
- External genitalia is female due to lack of androgen

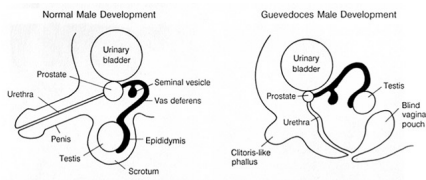
Testicular Feminization



5α Reductase Deficiency in an XY Individual

- Guevedoces (penis at 12)
- Testis
- AMH present so Mullerian ducts regress
- Wolffian ducts
- psuedovagina and female external genitalia
- at puberty may differentiate into more of a phenotypic male

Guevedoces Development



Normal tissue dependent upon testosterone is shown in black.