

Sexual Differentiation

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Sexual Differentiation

During the early stages of fetal development, the sex of the fetus is undetermined and has primordial genital ducts for both female and male. Thus the process of sexual differentiation is concerned with the Zygote differentiation and this is mainly to do with genes and chromosomes.

Humans have 46 chromosomes; 44 Somatic and 2 Sex Chromosomes (either XX or XY). The presence of the Y chromosome is what distinguishes the fetus as a male. The chromosome contains a "SRY gene" on its short arm and this gene is key in bringing about differentiation of gonadal cells into the testis.

Gonadal Differentiation- Male

During the 7th week of development, a H-Y antigen is formed from the SRY gene and this brings about regression of the gonadal cortex and formation of gonads in the gonadal medulla. Sertoli cells are made to secrete Antimüllerian hormone; this suppresses the development of the Müllerian duct (which in females differentiates into the fallopian tube, uterus and upper vagina). At the 8th week Leydig cells secrete testosterone which leads to internal and external genitalia formation; Internal genitalia, e.g. epididymis, vas deferens and seminal vesicle develop from the Wolffian duct. In females, the Wolffian duct regresses and the Müllerian duct differentiates, due to there being no Sertoli cells in the female and so no Antimüllerian hormone (that normally prevents the development of Müllerian duct).

External Genitalia

By the 7th week the fetus has a genital tubercle, urogenital sinus and labioscrotal folds. All these differentiate into external genitalia for both males and females:

- Genital Tubercle -- Glans Penis (Male) and Clitoris (Female)
- Urogenital Sinus -- Prostate, Prostatic Urethra and Urethra (Male) and Vagina (Female)
- Labioscrotal folds -- Urethra and Penis shaft (Male) and Labia Minora (Female)

Gonadal functions are gametogenesis and hormone secretion.

Bibliography

Guyton & Hall Textbook of Medical Physiology, 11th Edition