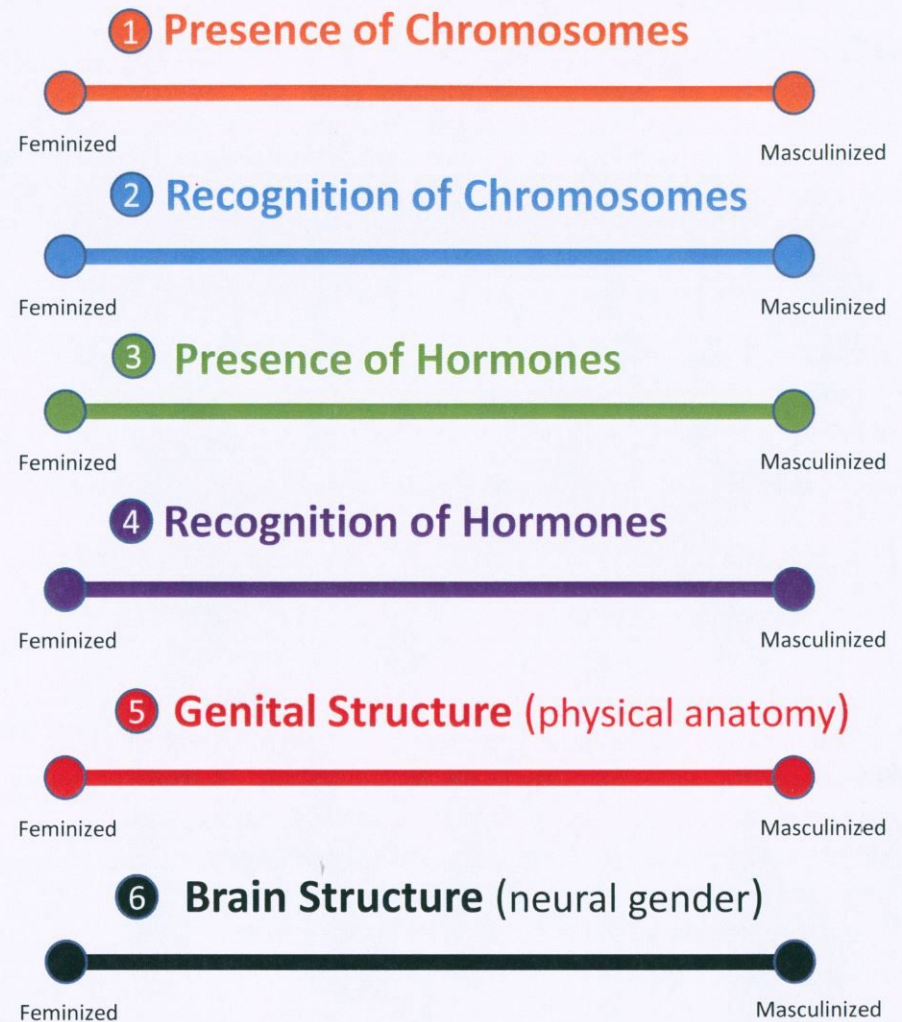


What Biological Processes Contribute to Sex Differentiation?



Biology Bear



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What Biological Processes Contribute to Sex Differentiation?

1 Presence of Chromosomes

There are many other naturally occurring combinations of sex chromosomes beyond just XX and XY. Those born with Klinefelter Syndrome have at least XXY, and women with Turner Syndrome are born with only one X. There are also Super males born with XYY and Super females with XXX.

2 Recognition of Chromosomes

For those born with XX, the body cannot act on both X chromosomes. The growing cells chose one X to develop. The other becomes dormant which is called X-inactivation. There are cases where a person with XY chromosomes was born with fully functional female genitalia. The theory is the Y chromosome went dormant, as the extra X normally would.

3 Presence of Hormones

Almost everyone has a mixture of testosterone and estrogen, it's just a matter of how much you have of each. In Hypogonadal Syndrome, the glands that would normally produce the largest amount of either testosterone (in the testicles) or estrogen (in the ovaries) produce little to NO hormones. This especially impacts the changes that happen in puberty.

4 Recognition of Hormones

Just because the body makes sex hormones, doesn't mean the body accepts them or acts on them. In Androgen Insensitivity Syndrome, even though the person is XY, the body does not recognize the male hormones that work to form the penis and testicles. The baby is born with genitalia resembling a vagina, but with no uterus or ovaries, and continues to identify as female in adulthood.

5 Genital Structure (physical anatomy)

When a baby is developing in the womb, there is no sex differentiation until the 6th week of development. At that time, if the body gets the signal from the Y chromosome to release testosterone and the body accepts it, that triggers the release of the hormone DHT which tells the genitals to develop as a penis and testicles. In those with 5-Alpha Reductase Deficiency, the body doesn't make DHT so the genitals develop as a vulva. During puberty, testosterone is released again and this time the body develops as a male (chest hair, pronounced Adam's apple, facial hair), including a masculinization of the genitals (what was thought to be a clitoris elongates, testicles descend, etc.)

6 Brain Structure (neural gender)

Numerous studies have shown that men and women have small differences in their brains. There are differences in structures, for example the hippocampus is larger in women and men have a larger amygdala. There are also differences in function, such as the rate of serotonin synthesis and opioid receptors. This differentiation begins at 12 weeks of development in the womb. We are beginning to understand (with the help of MRI scans) that those who are transgender do not have a matching neural gender and genital anatomy.