Why does the Y chromosome drive primary sex determination?

“Draw” Phenotypical Sexual Differentiation:

The presence of \_\_\_\_\_\_\_\_\_\_\_\_ in the brain causes de-feminization of the male hypothalamus.

Match the following terms to the correct definition:

Totipotent Pluripotent Multipotent

1. Have the ability to form a limited range of cells and tissues appropriate to their location (muscle cells for smooth and striated muscle, blood cells for RBC, WBC, and platelets, etc.)
2. Have the ability to form all cell types of the conceptus (STEM CELLS)
3. Have the ability to form several types of all three germ layers (ectoderm, mesoderm, endoderm) but not the whole organism

List and describe the three distinct renal systems:

What are some signs of puberty? What does it depend on?

What is the key central event of puberty?

Explain what the Hypothalamo- hypophyseal portal system is and its importance:

Describe the onset of puberty in females

Describe the onset of puberty in males

Explain the difference between a slow and fast response?

As a follicle increases in size, it produces more and more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (steroid hormone) which travels in the blood (bound to carrier protein) to the hypothalamus. The \_\_\_\_\_\_\_\_\_\_\_ (tonic or surge) center first becomes less sensitive to the negative feedback of estrogen. This shift stimulates a \_\_\_\_\_\_\_\_\_\_\_ (higher or lower) frequency of GnRH pulse from the \_\_\_\_\_\_\_\_\_\_ (tonic or surge) center which leads to further growth and development of follicles. Continued follicular growth stimulates concentrations of estrogen \_\_\_\_\_\_\_\_\_\_\_\_ (above or below) the threshold which in turn stimulates the \_\_\_\_\_\_\_\_\_\_ (tonic or surge) center of the hypothalamus. Stimulation of the \_\_\_\_\_\_\_\_\_\_\_ (tonic or surge) center of the hypothalamus results in the surge of \_\_\_\_\_\_\_ (LH or FSH) thus causing ovulation.

Describe some differences between male and female endocrine profiles and hypothalamic structures:

What’s the difference between lipid/steroid and protein hormone metabolism?

Explain the steroid biosynthetic pathway:

Cholesterol 🡪 🡪 Pregnenolone 🡪 🡪 Progesterone... 🡪 🡪 Estrogen 🡪 🡪 Testosterone 🡪 🡪Androstenedione

Match the following numbers to the different type of hormone signaling:

Protein Hormone Signaling Steroid Hormone Signaling

1. Forms a transcription factor when bound to receptor.
2. Uses cyclic AMP as a second messenger.
3. cAMP binds regulatory unit of protein kinase A.
4. Receptor is located within the cytoplasm of the cell.
5. Receptor has three domains: extracellular, transmembrane, and intracellular.
6. Requires a transport protein to travel to target tissue.
7. Utilizes Heat Shock Proteins.
8. ATP activates Adenylate cyclase.

Now that we know what goes with what when it comes to signaling, let’s look at each closer:

How do steroid hormones stimulate a cellular effect? Use Estrogen as an example and draw out this process:

Draw how protein/peptide hormones stimulate a cellular effect: