Once the blastocyst enters the uterus between day 7-9 of gestation, the inner cell mass differentiates into three germ layers. Which germ layer does the reproductive system develop from?

- Mesoderm = REPRODUCTIVE SYSTEM, muscular, skeletal, cardiovascular system, kidney, and urinary ducts

The ectoderm gives rise to the nervous system, skin, and hair. Which component of the reproductive system develops from this germ layer?

- Ectoderm = HYPOTHALAMUS, ANTERIOR AND POSTERIOR PITUITARY, CNS, sweat glands, hair, hooves

Match the following terms to the correct definition:

B Totipotent C Pluripotent A Multipotent

a. 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.)
b. Have the ability to form all cell types of the conceptus (STEM CELLS)
c. Have the ability to form several types of all three germ layers (ectoderm, mesoderm, endoderm) but not the whole organism

What organs are derived from the endoderm?

- Endoderm = PRIMORDIAL GERM CELLS, digestive/endocrine systems, lungs, liver, pancreas

The Posterior Pituitary

a. Only stores oxytocin ****
b. Developed from the roof of the mouth
c. Uses the hypothalamo-hypopseal portal system
d. Is the neurohypophysis
e. Both A and D

The Anterior Pituitary

a. Produces LH and FSH
b. Develops from the roof of the mouth (gives rise to Rathke's pouch)
c. Receives chemical messengers via the hypothalamo-hypopseal portal system
d. Is the adenohypophysis
e. All of the above

Match the following terms to the correct definition:

C Autocrine A Endocrine B Paracrine

a. Distant signaling with use of the circulatory system
b. Signaling to nearby/adjacent cells
c. Self-signaling

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

The hypothalamus surge center has 3 components and is found (only/both) in the (male/female)

1. PON: Preoptic Nucleus
2. SCN: Suprachiasmatic nucleus
3. AHA: Anterior Hypothalamic Area

The hypothalamus tonic center has 3 components and is found (only/both) in the (male/female)

1. VMN: Ventromedial nucleus
2. ARC: Arcuate Nucleus
3. ME: Median eminence

What is puberty?

a. The ability to accomplish puberty
b. The ability to accomplish copulation
c. The ability to accomplish reproduction successfully
d. The ability to cry

What are some signs of puberty? What does it depend on?
Signs: ovulation, semen production, mating response
Dependent upon: genetics, social cues, environment, body size/fatness

What is the key central event of puberty?
GnRH stimulates gonadotrophins (LH/FSH) which allows spermatogenesis and gametogenesis, and development of reproductive tissue

What does puberty begin with?
A "kiss" (kisspeptin neurons)

What are the possible sex chromosomes a spermatozoa can have?
X & Y

What forms the anterior pituitary lobe (adenohypophysis)?
-tissue in roof of embryo's mouth
-rathke's pouch
-stomodeal ectoderm

What forms the posterior pituitary (neurohypophysis)?
-floor of brain
Diverticulum develops from flood and grows ventrally towards Rathke's pouch

What are the 5 things that can affect puberty?
Hormonal, genetics, social, environment, nutritional

What drives puberty?
GnRH

Explain Kisspeptin's relationship with GnRH Neurons:

- Kisspeptin neurons are directly affected by blood glucose, fatty acids, and leptin which communicate directly with GnRH neurons

What are some changes in hypothalamic sensitivity in FEMALES?
Prepubertal female:
Low frequency GnRH pulses from the tonic center results in low stimulation of estradiol resulting in insufficient stimulation of the surge center

Postpubertal female:
Higher frequency GnRH pulses from the tonic center results in stimulation of estradiol above threshold concentrations to stimulate the surge center resulting in the preovulatory LH surge

What are some changes in hypothalamic sensitivity in MALES?
Prepubertal male:
GnRH is very sensitive to negative feedback of testosterone/estrogen

Postpubertal male:
Decreased GnRH sensitive to negative feedback results in more GnRH released producing greater concentration of testosterone/estrogen