Session 3.2
Zoom Meeting #1
03.24.2020

Let's talk about Hormones! These are ones we have already talked about throughout the semester:

Gland:	Hormone:	Chemical Class:	Principle Function:
Ovary	Estrogen	Steroid	Mating behavior; secondary sex characteristics; maintenance of female duct system
Ovary	Testosterone	Steroid	Precursor of estrogen
Ovary	Progesterone	Steroid	Maintains pregnancy; mammary growth; inhibits myometrial contractions
Testes	Testosterone (androgens)	Steroid	Male mating behavior; spermatogenesis; maintenance of male duct system
Placenta	Progesterone	Steroid	*see ovary section
Uterine Endometrium	PGF2A	FA/Lipid	Causes regression of CL; stimulates myometrial contractions; ovulation
Seminal Vesicles	PGF2A	FA/Lipid	Stimulates myometrial contractions – transports sperm up FRT
Pineal	Melatonin	Biogenic Amine	Controls seasonal reproduction in mares and ewes
Posterior Pituitary	Oxytocin ***storage NOT production	Peptide	Stimulates myometrial contractions for transport of sperm; parturition; milk let-down
Anterior Pituitary	Follicle Stimulating Hormone (FSH)	Glycoprotein	Stimulates follicle growth, estrogen production, spermatogenesis
Anterior Pituitary	Luteinizing Hormone	Glycoprotein	Stimulate ovulation; supports CL formation and progesterone secretion; stimulates testosterone synthesis by Leydig cells of the testis
Hypothalamus	Gonadotropin Releasing Hormone (GnRH)	Peptide	Stimulates release of LH and FSH from anterior pituitary
Hypothalamus	Oxytocin	Peptide	Produced by hypothalamus, released by posterior pituitary

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These are other important hormones that play a role in reproduction:

Gland:	Hormone:	Chemical Class:	Principle Function:
Ovary	Inhibin	Protein	Inhibits the release of FSH from anterior pituitary
Ovary	Relaxin (Sow CL)	Protein	Expands the pelvis; dilation of cervix for parturition
Testis	Inhibin	Protein	Inhibits the release of FSH from anterior pituitary
Adrenal Cortex	Glucocorticoids Corticosteroids (Cortisol)	Steroid	Induction of partiurtion by fetus; milk synthesis; stress responses
Placenta	Human Chorionic Gonadotrophin	Glycoprotein	LH-like involvement with establishment of pregnancy in women; supports & maintains CL
Placenta	Equine Chorionic Gonadotropin	Glycoprotein	FSH-like (some LH) activity; immunological protection of foal during pregnancy; formation of accessory CLs
Placenta	Relaxin (Cow & Ewe)	Protein	Relaxation/dilation of cervix for parturition
Placenta	Placental Lactogen	Glycoprotein	Maintains CL; stimulates mammary growth & milk secretion
Liver	Insulin-like Growth Factors (IGF-1 and IGF-2)	Protein	Stimulates steroidogenesis; mammary growth; fetal growth
Anterior pituitary	Prolactin (PRL)	Protein	Stimulates milk synthesis; regulate metabolism for milk synthesis; effect maternal behavior
Anterior pituitary	Growth Hormone (GH)	Protein	Stimulates milk synthesis through IGF-1 secretion
Anterior pituitary	Adrenalcorticotropic Hormone (ACTH)	Protein	Release of corticosteroids and glucocorticoids from adrenal cortex initiate parturition

Hypothalamus	Dopamine	Biogenic Amine	Inhibits release of prolactin
Hypothalamus	Corticotropic Releasing Hormone (CRH)	Peptide	Stimulates ACTH
Hypothalamus	Growth Hormone Releasing Factor (GHR)	Peptide	Stimulates release of Growth Hormone

Match the following to the correct terms:

Peptide C Protein A Glycoprotein D Steroids B Lipids F Biogenic Amine E

a. Long chains of amino acids
b. Cholesterol is the precursor
c. Few to several amino acids
d. Protein hormone with carbohydrate molecules
e. Derived from Tyrosine or Tryptophan
f. From Arachidonic Acid

How many Carbons are found within Cholesterol?

27 carbons

How many Carbons are found within Progesterone?

21 carbons

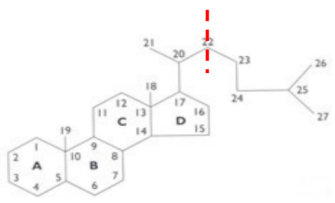
How many Carbons are found within Estrogen?

18 carbons

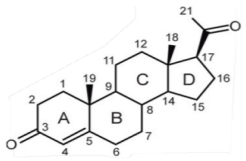
How many Carbons are found within Testosterone?

19 carbons

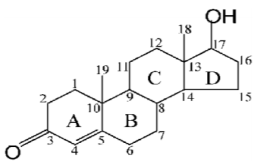
Since we know how many Carbons are in steroid hormones, label what structure is….



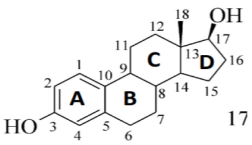
Cholesterol



Progesterone



Testosterone



Estrogen

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Match the following terms to the correct definition:

Autocrine C Endocrine A Paracrine B

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

The endocrine system has 2 general control mechanisms. What are they?

Neural control (neuroendocrinology) : something from Central Nervous System controls hormones

- Hypothalamus = neural control for reproduction

Endocrine System : releases hormones to travel in circulation

- Hormone action occur away from site of synthesis

For the brain to become "femininized" what has to enter the brain?

- Nothing. Alphafetoprotein has a high affinity for estrogen. It does not bind to testosterone which allows testosterone to enter the brain and be synthesized into estrogen to inhibit the surge center from being created.

What hormones can travel freely in the blood?

Peptide, protein, and glycoproteins

What has to have a carrier protein?

Steroids and lipids