SI Session 3.2

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 Endocrine System has 2 general control mechanisms. What are they?

① Neural control (Neuroendocrinology): something from CNS controls hormones
- hypothalamus = neural control for reproduction

② Endocrine system: releases hormones to travel in circulation
- hormone actions occur away from site of synthesis

Hormone = controller of reproduction = chemical messengers produced by endocrine tissue that acts in a remote area - targets tissue to bring about change

Explain the difference between a simple, neural reflex, and a neuroendocrine reflex:

- Simple neural reflex: very basic, contains only one space where information in the spinal cord travels between two nerve cells (neurons)
  - neurotransmitter causes a direct, fast response

- Neuroendocrine reflex: combines nervous/endocrine system, a response will cause hormones to be released to reach a target tissue and cause a response

The presence of Estrogen in the brain causes defiminization of the male hypothalamus.

List the hormones these structures produce:

Hypothalamus:
GnRH - by GnRH neurons = Neuroendocrine communication
PRH = Prolactin releasing hormone

Anterior Pituitary: Adenohypophysis
Cells:
- Gonadotroph: releases LH and FSH
- Lactrotroph: releases PRL (Prolactin)

Posterior Pituitary: N/A Neurohypophysis
- only stores OT (oxytocin)

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

] gives pre-ovulatory LH surge

nucleus = cluster of neurons

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

] gives tonic LH release

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

- Carries hypothalamic hormones to the Ant. Pit. without dilution in systemic blood (Cap. → vein → Cap.)

- Important because: allows for rapid response, allows for a large surface area to deliver hormone, little dilution of hormone as they don't have to travel far: only a trace amount needed to cause a response - peptide hormones have a short 1/2 life

List the biochemical type of hormones:

Amount in body:	g:	Hormone:
10^{-3}	mg	Glucose
10^{-6}	µg	Immune factors
10^{-9}	ng	progesterone
10^{-12}	pg	Estrogen
10^{-15}	fg	Leukotrines/others

travel freely in blood

1. Peptide: few to several amino acids
   - mainly produced in hypothalamus
2. Protein: long chain of amino acids
   - mainly produced in the ant. Pit.
3. Glycoprotein: Protein hormone + carbohydrate molecules
   - more carbs = T in 1/2 life

Protein

4. Steroids - cholesterol is the precursor
5. Lipids - from Arachidonic Acid (precursor) → Prostaglandins
   - produced from fatty acids
6. Biogenic Amine: derived from Tyrosine and Tryptophan