Neural endocrine glands
Hypothalamus and Pituitary

Hypothalamus

• Present in all vertebrates
• Integrative site
• Controls pituitary
• Regulates behavior, sex drive, temperature, feed intake, release of other hormones

Functions and Components

• Anterior
• Middle
• Posterior
  - Bordered anteriorly by the optic chiasma, Bordered posteriorly by the mammary nuclei
• Compartmentalized and sends axons to the pituitary gland
• SCN
• VMN

Functions and Components

• Uses individual pockets of nuclei to regulate the pituitary
• Hypophysiotropic area
• 1:1 relationship between hypothalamic and pituitary hormones
• Cyclic and tonic releases

Functions and Components

• Direct regulation of pituitary
- Axonoplasmic flow of oxytocin and vasopressin through axons

- Indirect regulation of pituitary
  - Median Eminence to anterior pituitary through the circulatory system

**Functions and Components**

- Hypothalamic Hypophysial portal system
  - The vessels that connect the hypothalamic circulation with the pituitary circulation

- All hypothalamic hormones are peptides

- Best known are TRF, LH, GHIF, GHSF

**Releasing factors**

- Hypothalamic hormones are called releasing factors
  - Regulated by both internal and external stimuli as well as chronotropic effects
  - Examples

**Pituitary**

- Sits in the sella turcica
- Must be directly connected to the hypothalamus to function correctly
- Not really a master gland
- Dual organ
  - Anterior/posterior
- Essential to life?
Pituitary

• Adenohypophysis (anterior, glandular)
  - Pars Distalis
    • Largest, 80%
  - Pars intermedia
    • Small in adults, large in infants
  - Pars tuberalis
    • Wraps around P.I., contains portal system
  - produces 8 hormones

Pituitary

• Neurohypophysis (posterior, neural)
  - Pars Nervosa
  - Pars infidibulum
    • Stalk attaching the PP to the hypothalamus
    • Turns into the Median eminence
  - releases 2 hormones

Pituitary

• Nerve supply
• Blood supply
• Zonation

• Start here
• Microanatomy
  - Pars distalis
  - 75% chromophils
    • Acidophils GH PRL
    • Basophils FSH, LH, TSH
  - 25% chromophobes
  - Cells change morphology
  - Not clear where ACTH, LPH, and MSH are formed

Pituitary

• Microanatomy
  - Pars Intermedia
  - Not present in all mammals
  - Contains
    - Type I - MSH
    - Type II cells - MSH, LPH, ACTH

Pituitary

• Microanatomy
  - Neurohypophysis
    • Modified neural tissue
    • Neurophysin
    • Pituicytes

Quiz 2

• Compare the Anterior and posterior pituitary