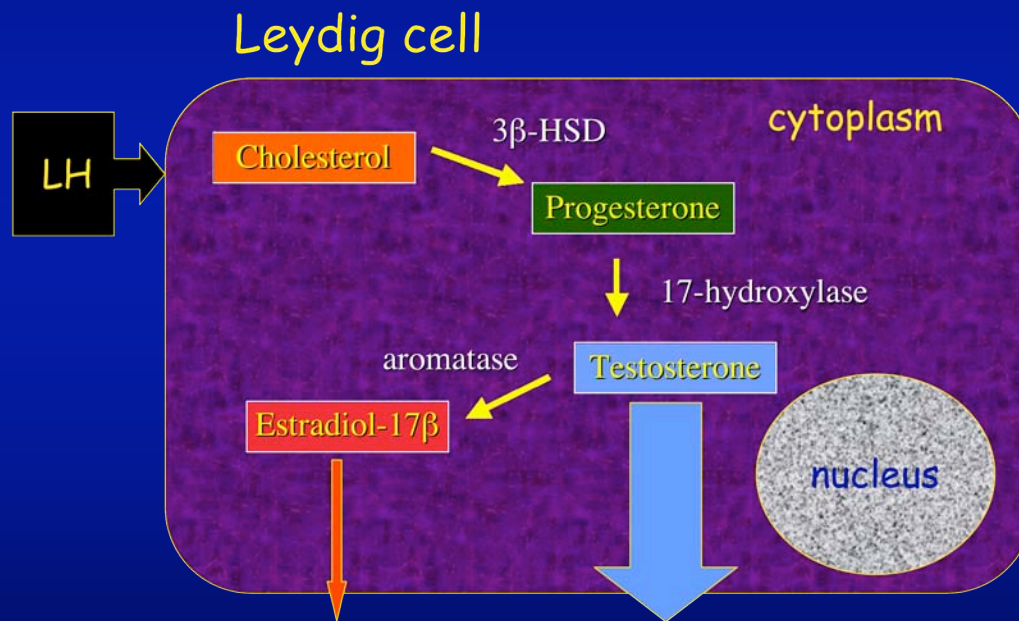
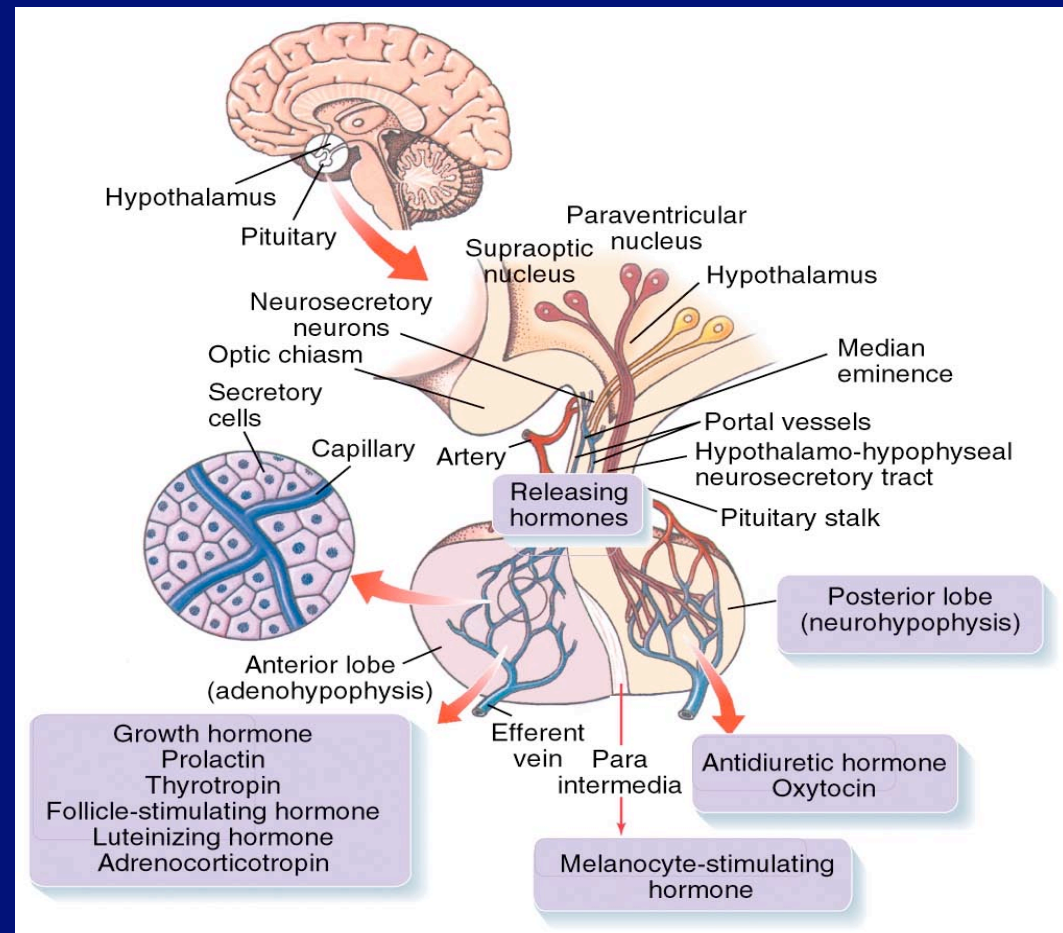
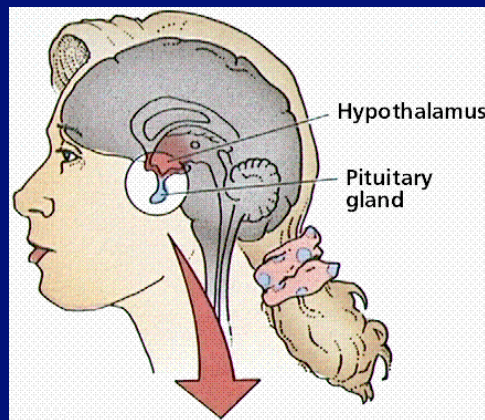


Reproductive Endocrinology

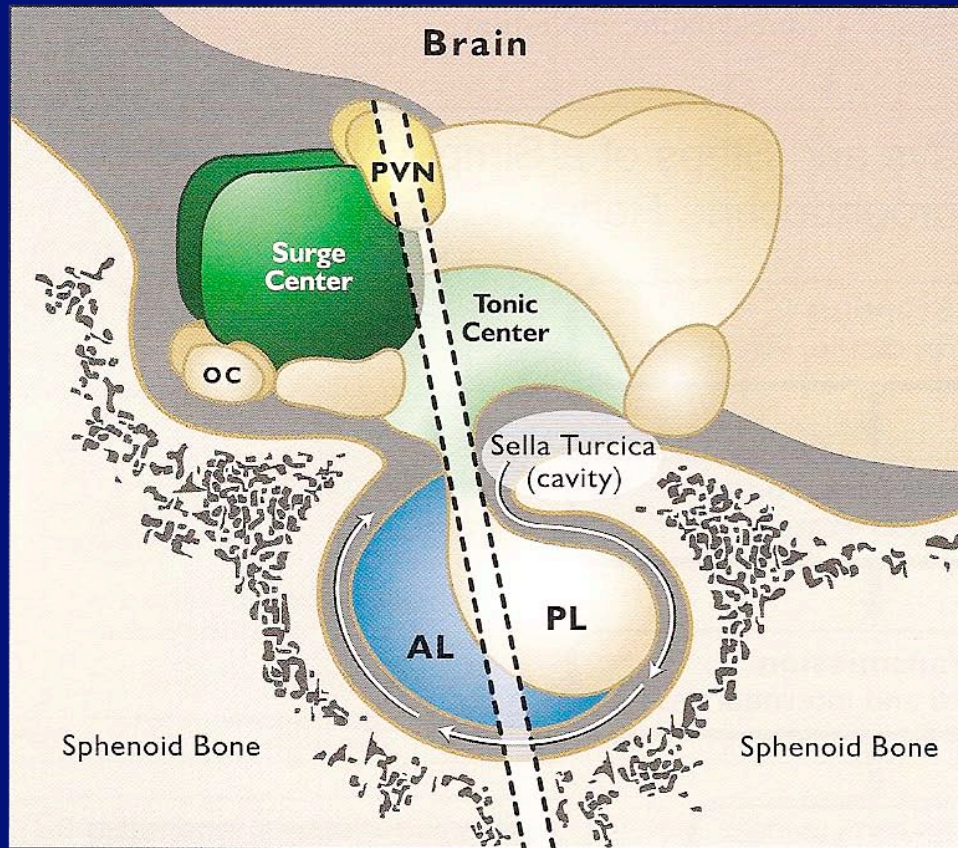


Hypothalamus - Pituitary

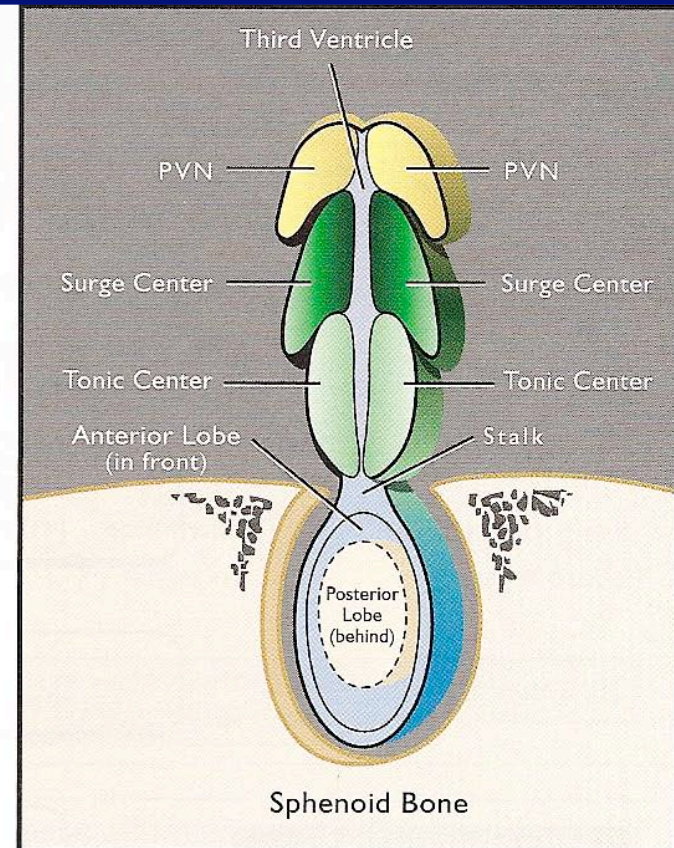
- considered the master organs of the endocrine system



Hypothalamus



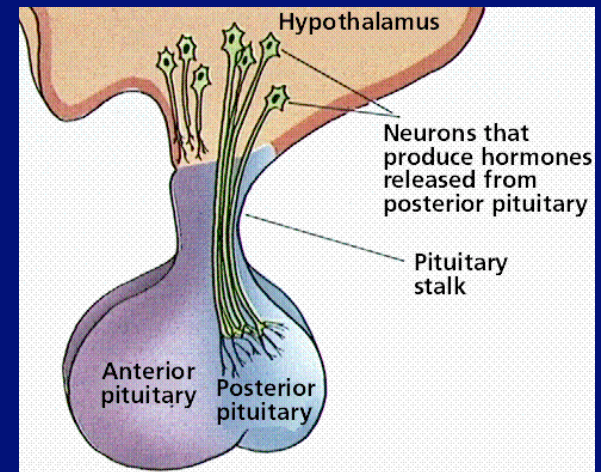
Sagittal view



Frontal view

Hypothalamus

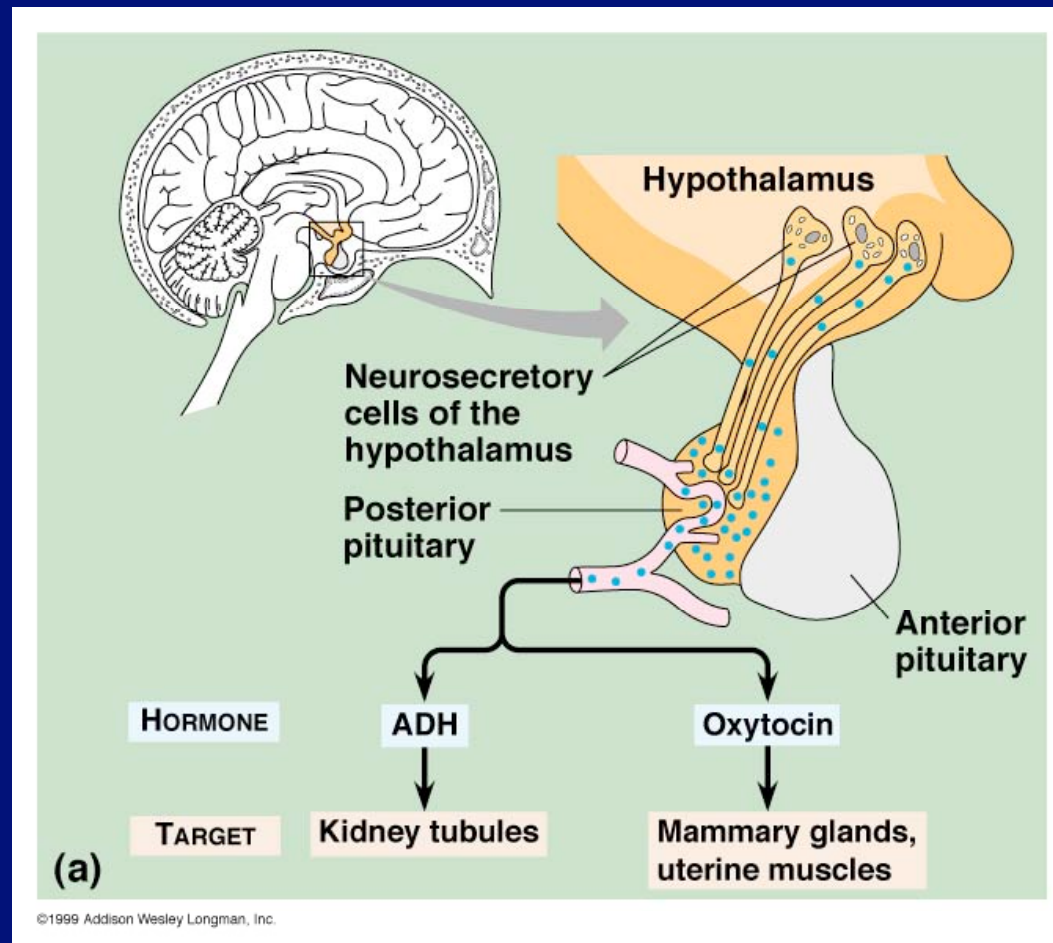
- bottom of 3rd ventricle of brain
- secretes
 - neurohormones that influence synthesis and release of pituitary hormones
 - examples:
 - gonadotropin releasing hormone (GnRH)
 - thyrotropin releasing hormone (TRH)
 - dopamine - Prolactin releasing inhibiting factor
 - released into hypothalamo-hypophysial portal system
 - blood vessel system between hypothalamus and pituitary



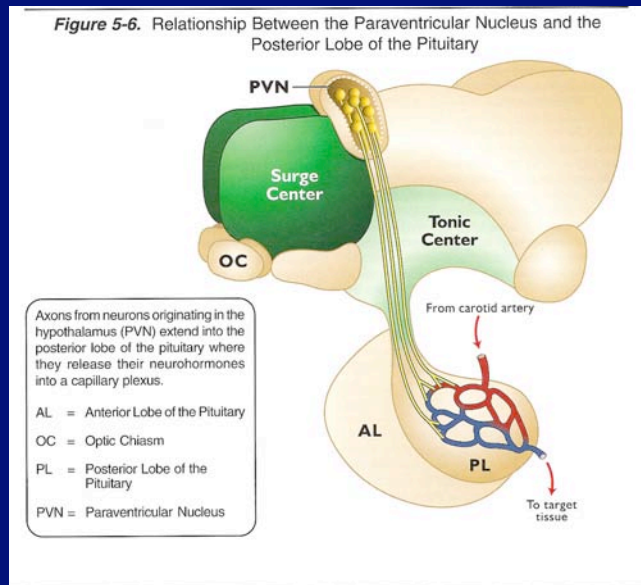
Pituitary - Hypophysis

- center of the soul in classical times
- derived from two tissues embryologically
 - adenohypophysis (anterior pituitary) - derived from outpocketing of mouth - Rathke's pouch
 - neurohypophysis (posterior pituitary) - derived from outpocketing of third ventricle and hypothalamus
- these two extensions meet, interact and form pituitary with two distinct regions as noted

Neurohypophysis



Paraventricular Nucleus



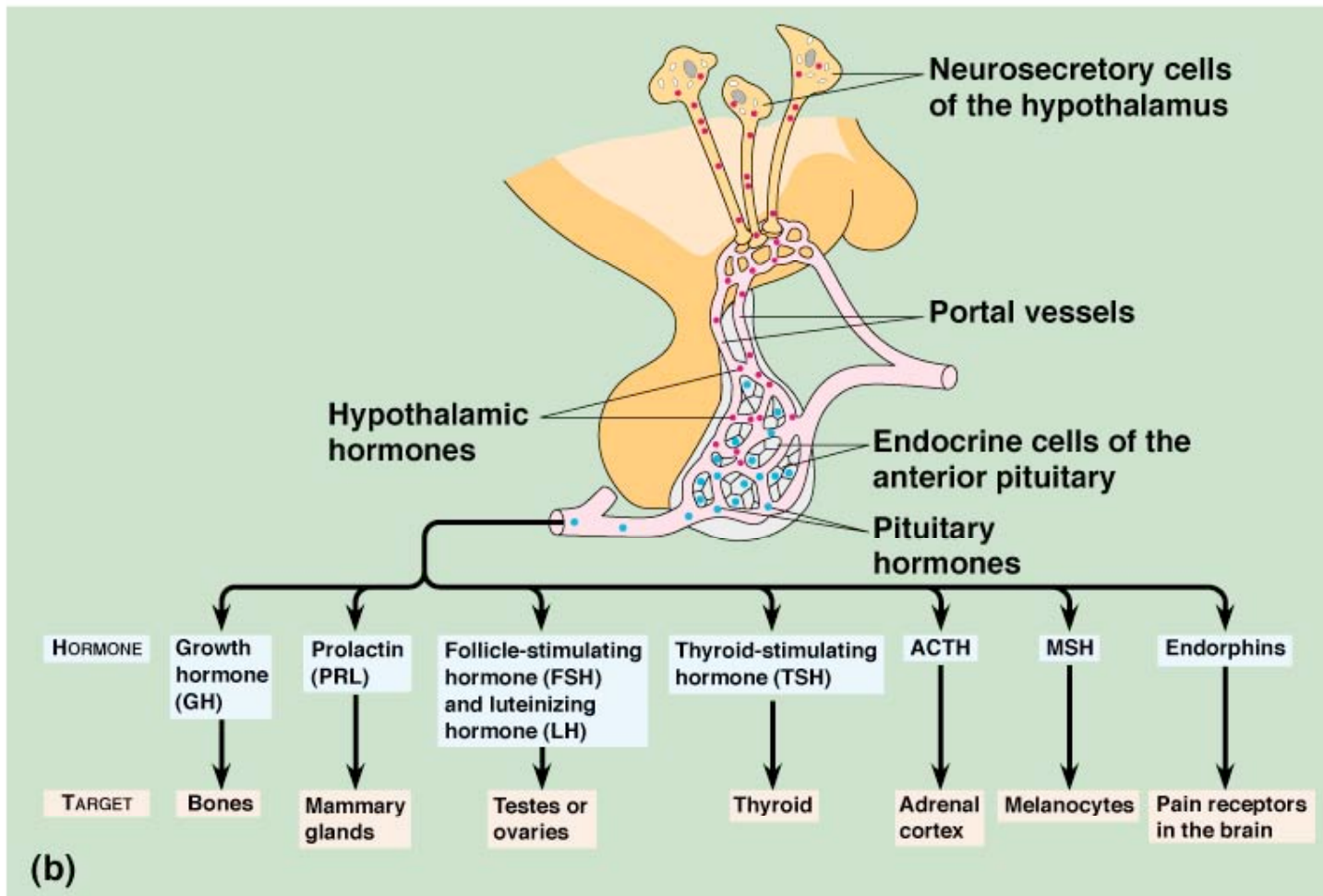
PVN

- Cell bodies for neurosecretory neurons
- releases neurohormones into blood in neurohypophysis

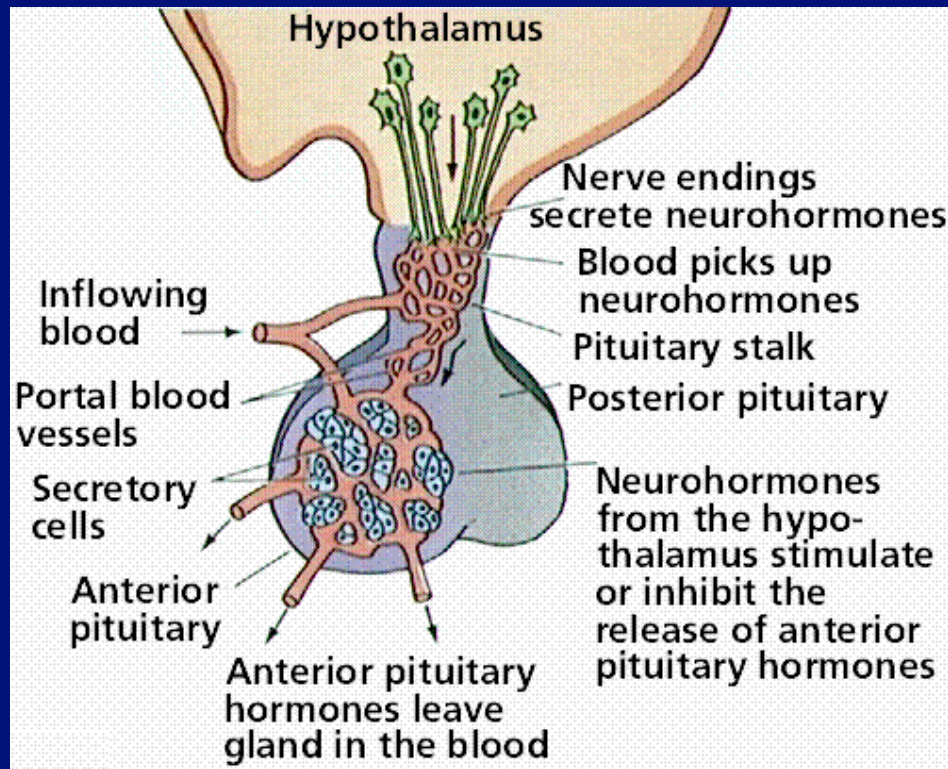
Two hormones

- Oxytocin
- Arginine vasopressin (ADH)

Adenohypophysis



Hypothalamo-hypophysial Portal System

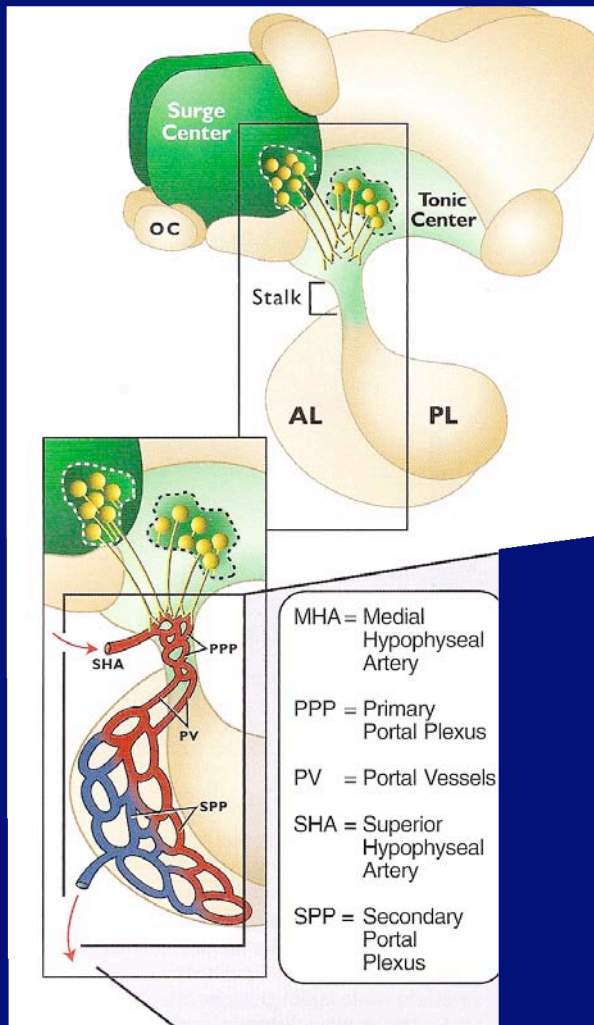


- A portal system
 - Vein - vein
 - Low pressure system
- Delivers hypothalamic factors to pituitary

Reproductive Endocrinology

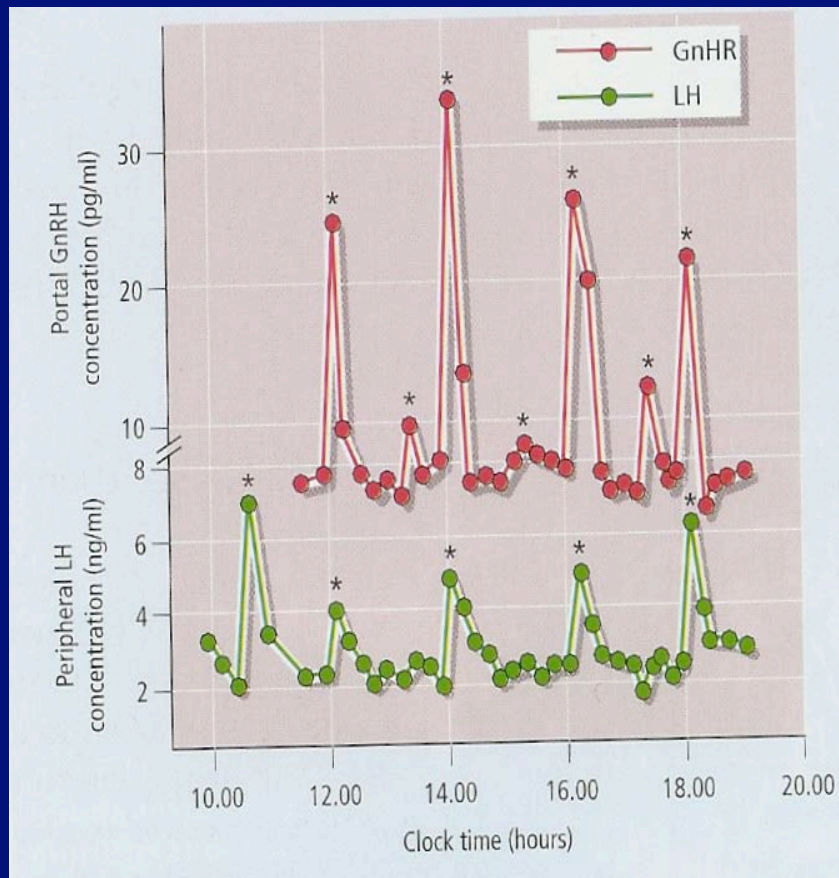
- Hypothalamic hormones
 - Gonadotropin releasing hormone (GnRH)
 - stimulate release of
 - FSH = follicle stimulating hormone
 - LH = luteinizing hormone
 - from pituitary
- 'Gonadotropin' = gonad stimulating

Hypothalamic Surge/Tonic Centers



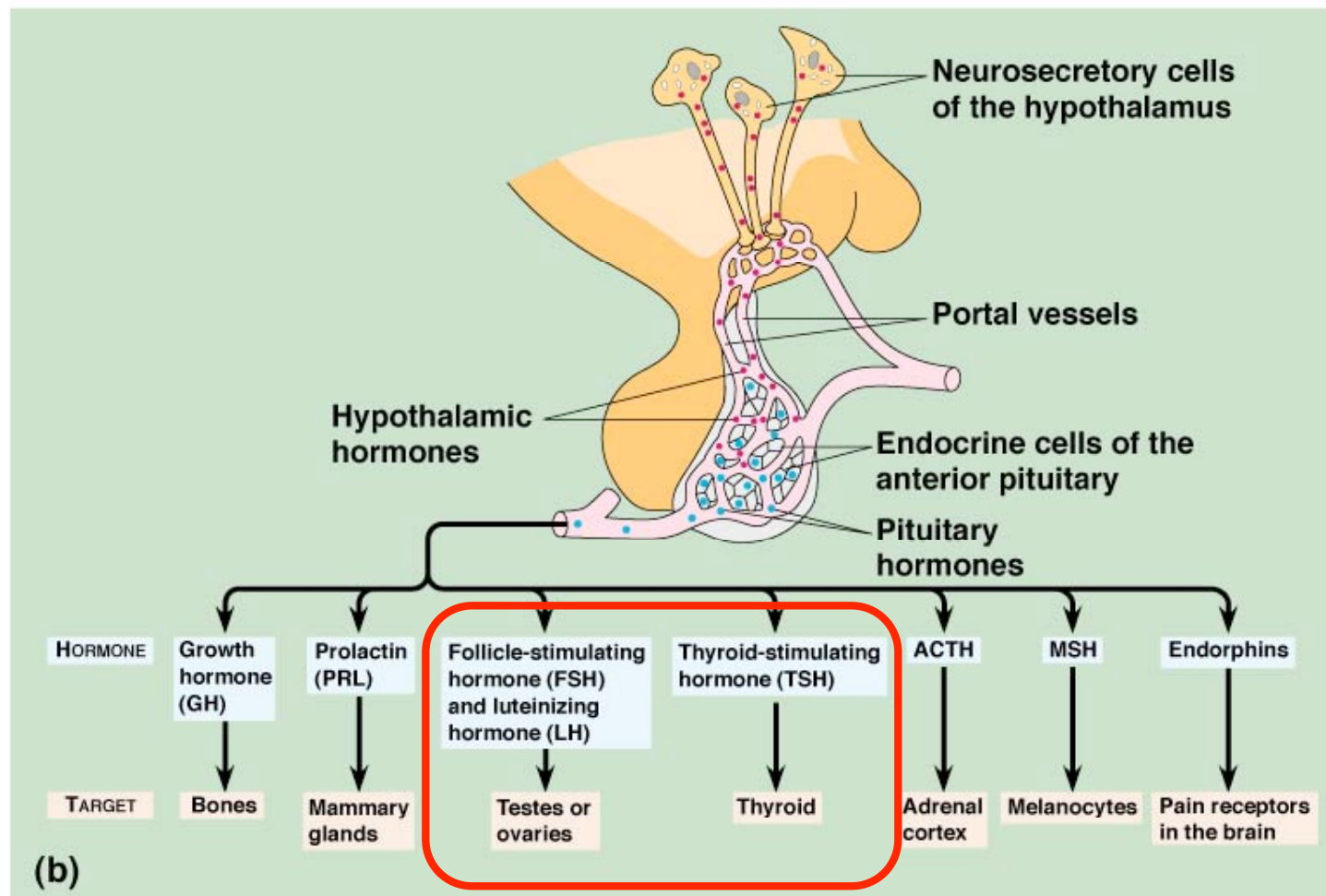
- Neurosecretory neurons from surge and tonic centers deposit neurohormones into portal system
- Portal system delivers these hormones to the adenohypophysis

GnRH release is pulsatile



- GnRH pulse generator in hypothalamus called 'circadian clock'
- Circadian pulses
 - One pulse every hour
 - Each LH peak coincides with a GnRH pulse

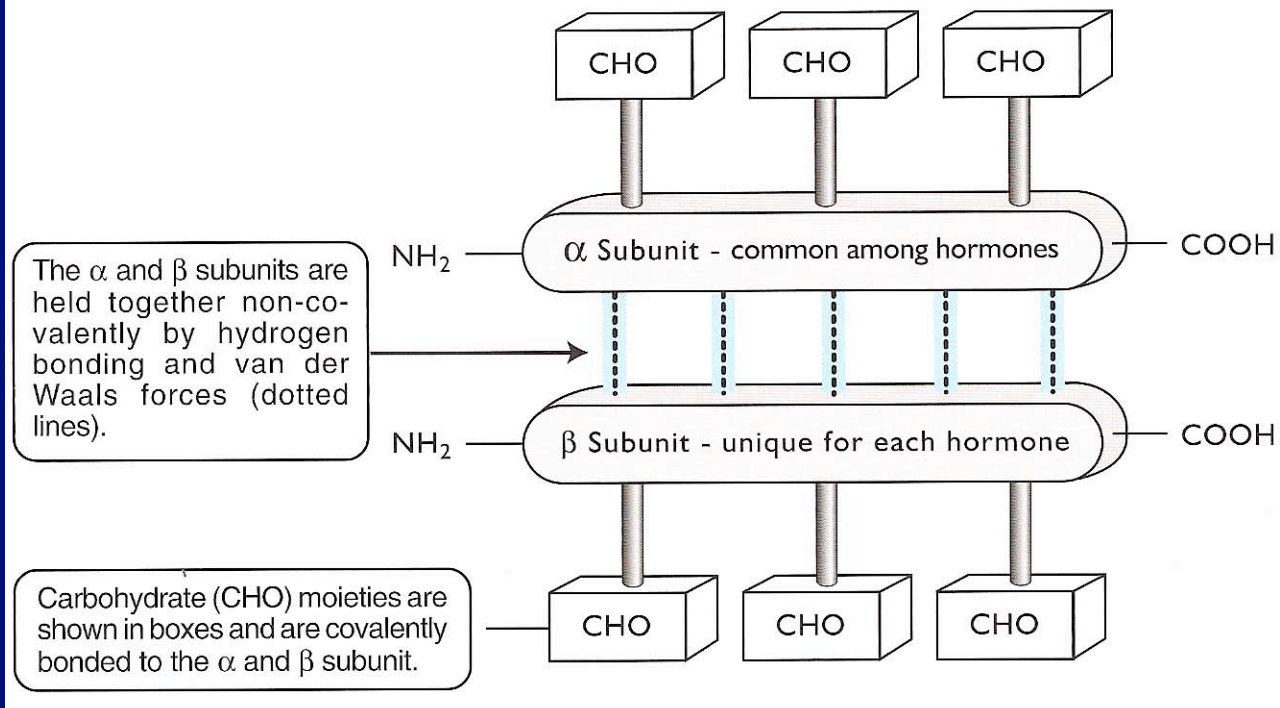
Adenohypophysis



Pituitary Glycoproteins

FSH - LH - TSH

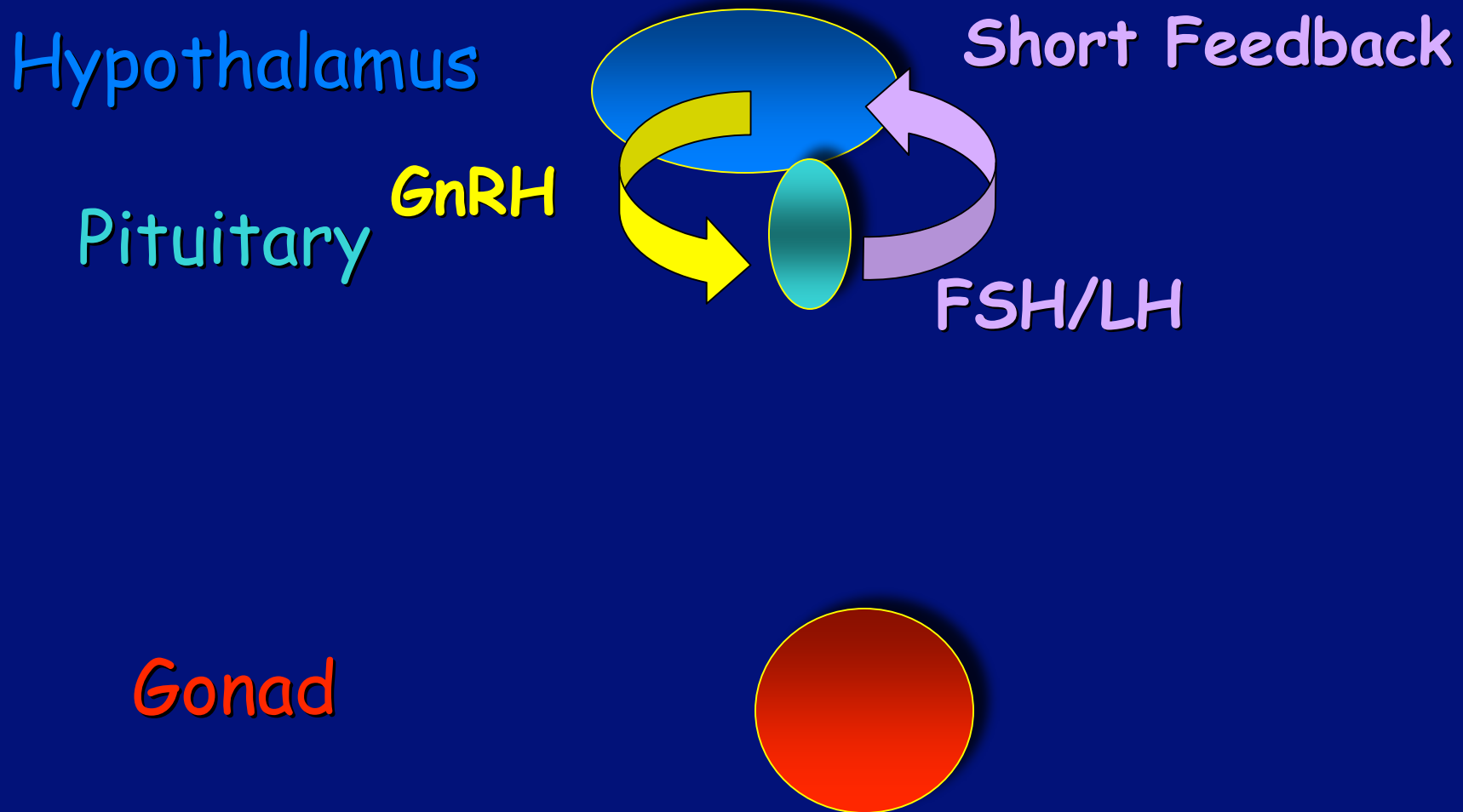
Figure 5-8. Diagram of an Anterior Lobe Glycoprotein Hormone



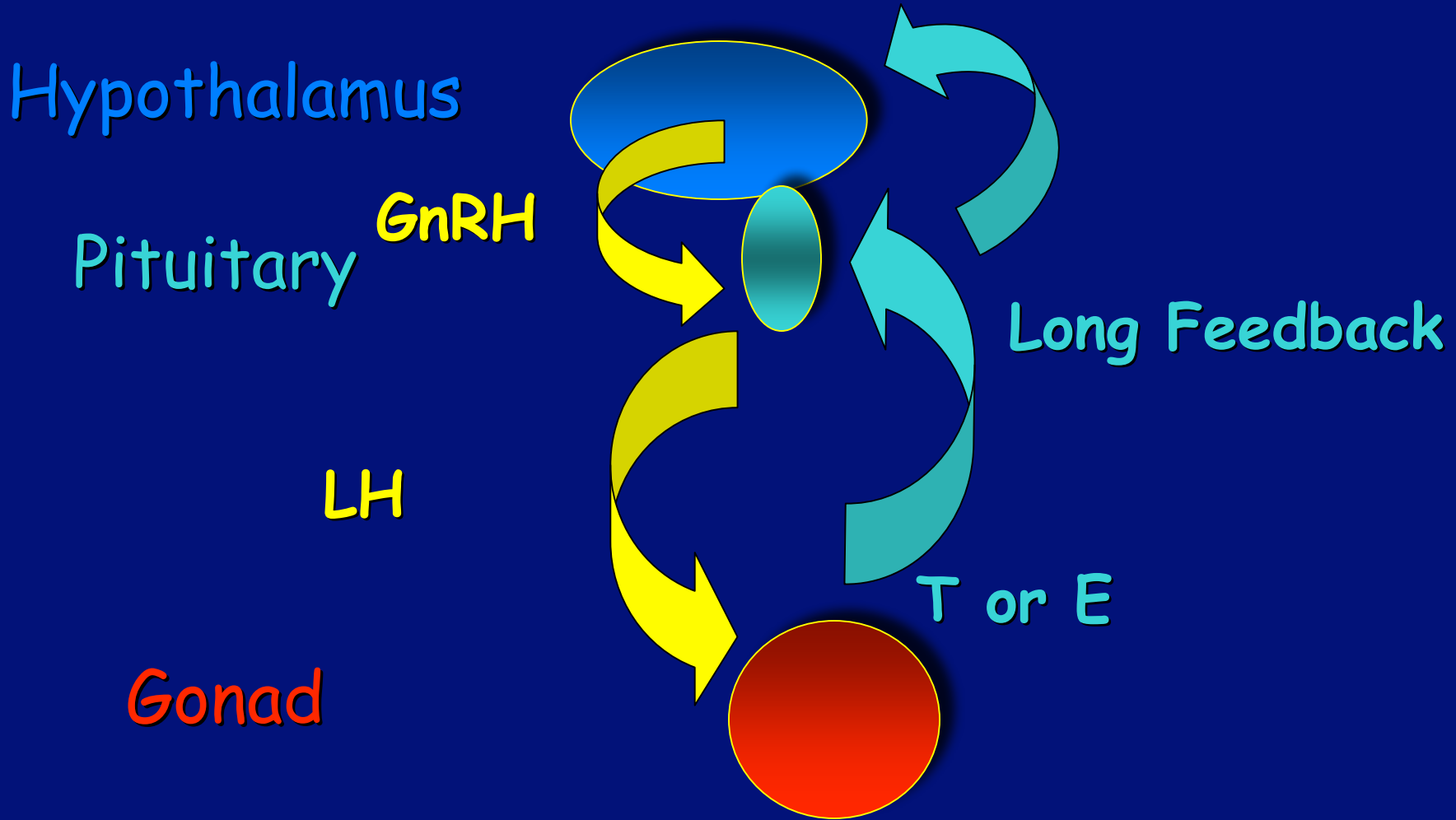
Pituitary Hormones

- Follicle stimulating hormone
 - stimulates gametogenesis in males and females
- Luteinizing Hormone
 - stimulates steroidogenesis in males and females
- Prolactin
 - stimulates the synthesis of milk in mammalian females
 - maternal behavior in some species
- Oxytocin -
 - stimulates smooth muscle contraction
 - associated with birth and milk release

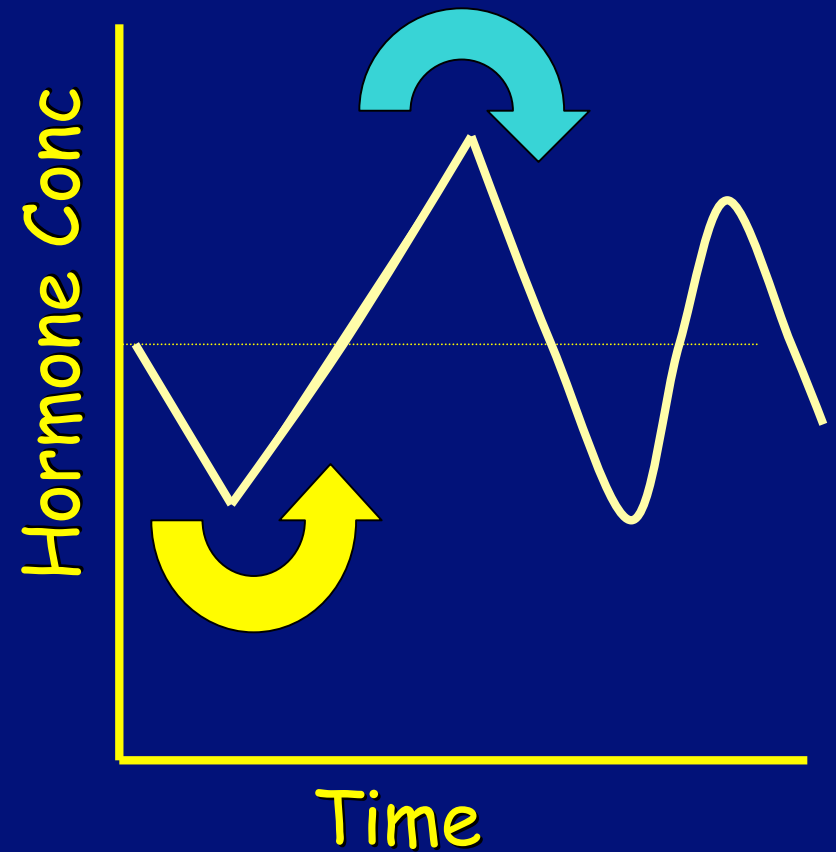
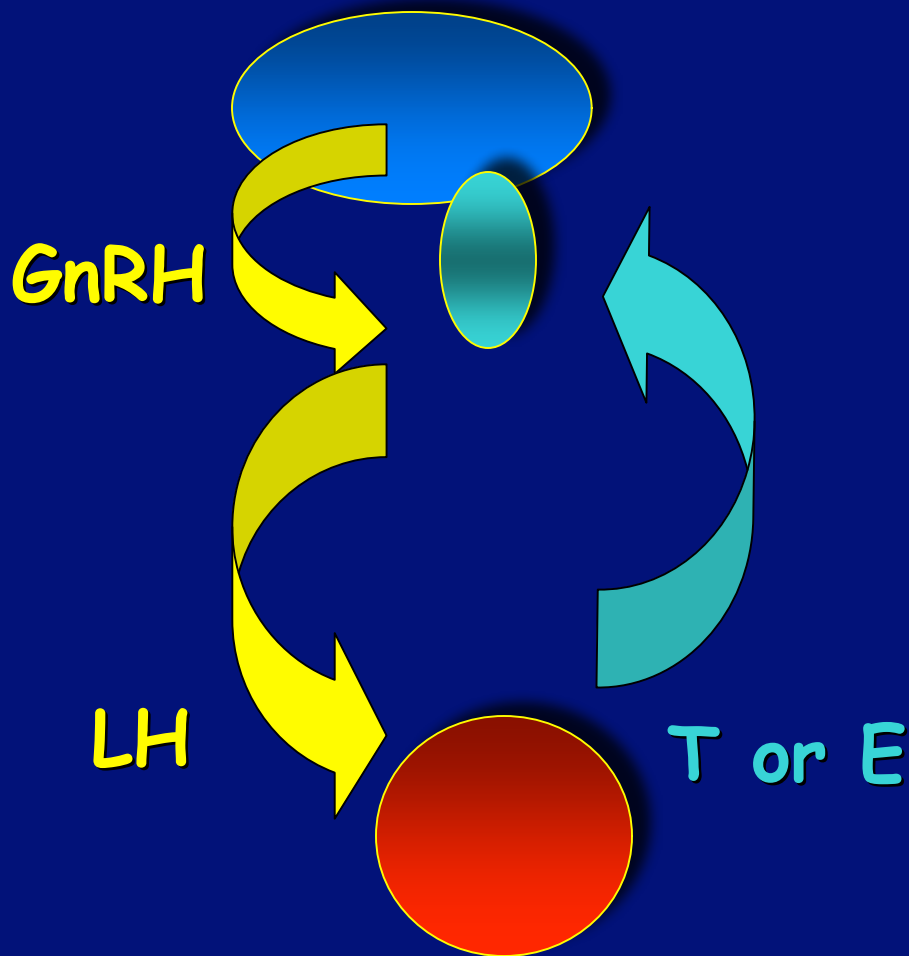
Negative Feedback



Negative Feedback



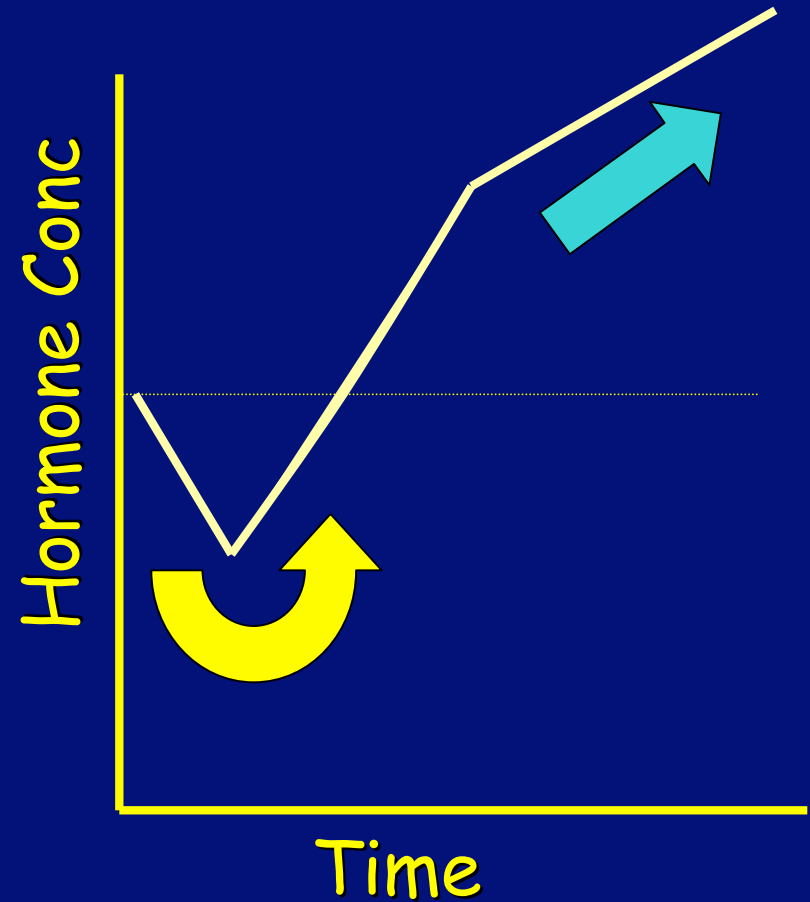
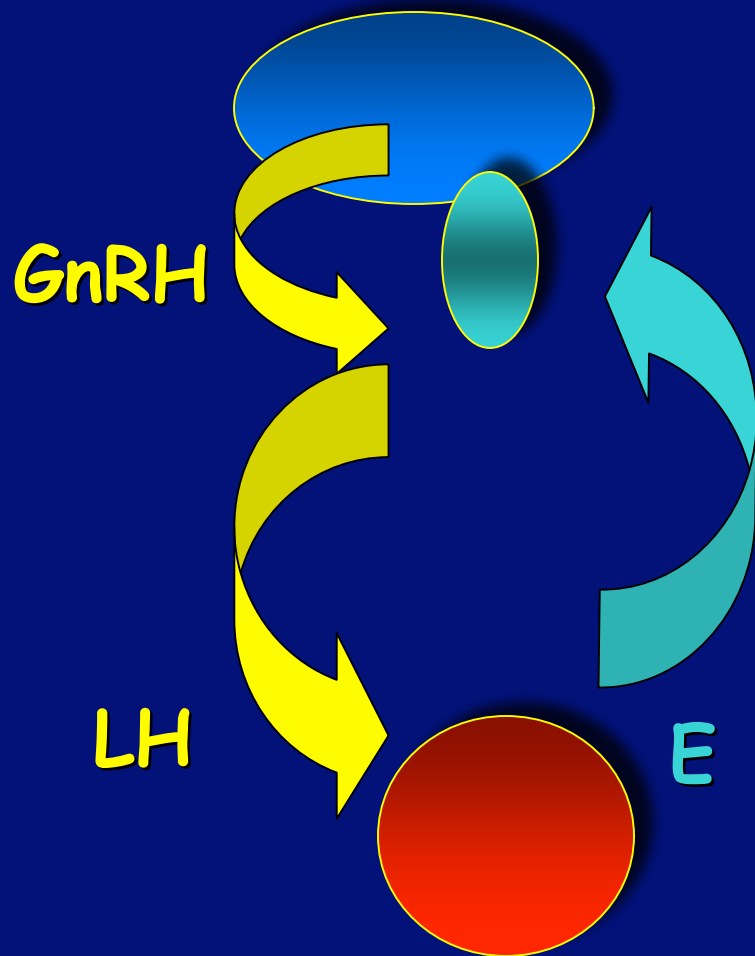
Negative Feedback & Homeostasis



Negative feedback

- 1. peptide hormones
 - alter G protein response
- 2. steroid hormones
 - E_2 and P_4 decrease transcription of β FSH-mRNA and levels of β FSH-mRNA
 - P_4 causes decrease in GnRH release

Positive Feedback & Homeostasis



Permissive action of hormones

- steroid hormones may act as permissive agents by
 - increase number of receptors
 - increase protein kinases
 - increase inhibitors of cyclic nucleotides