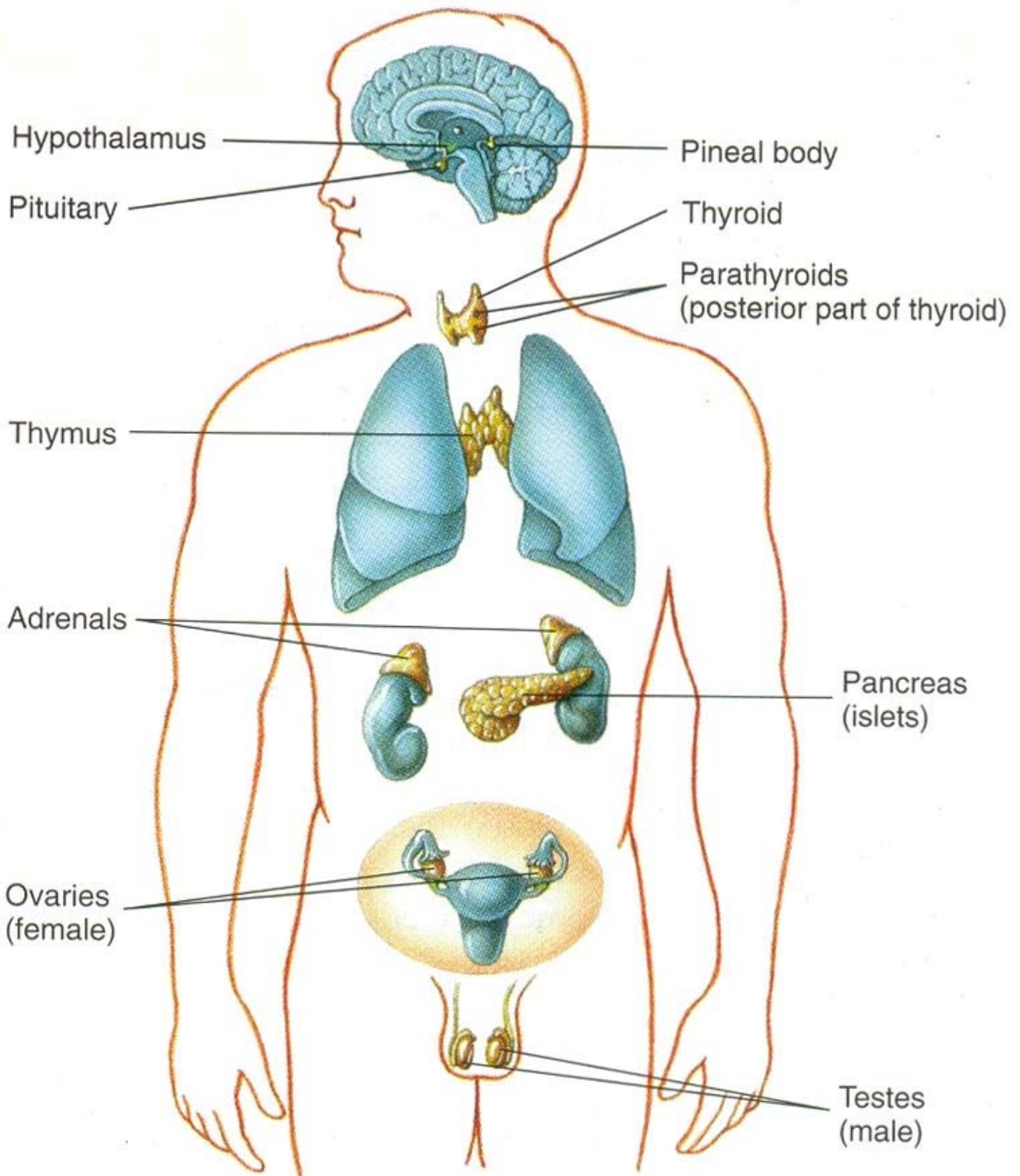
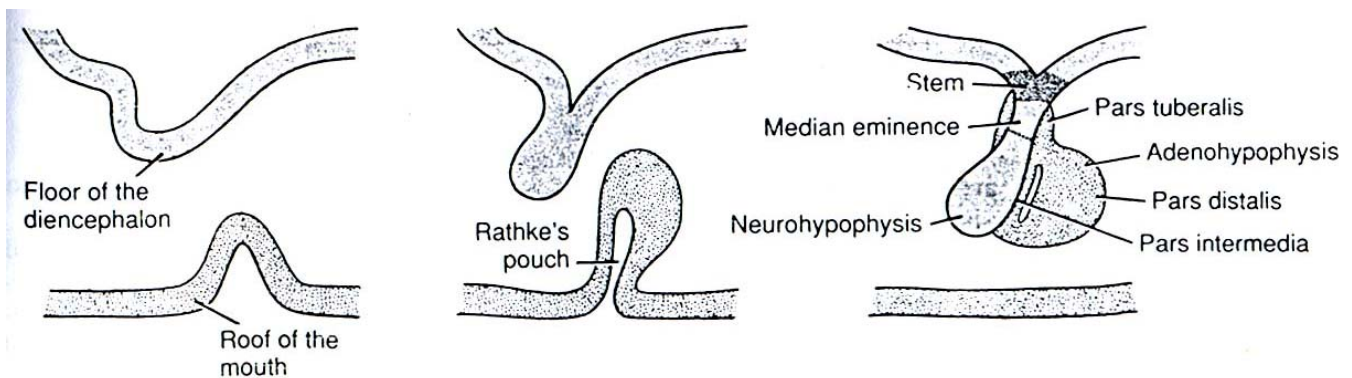
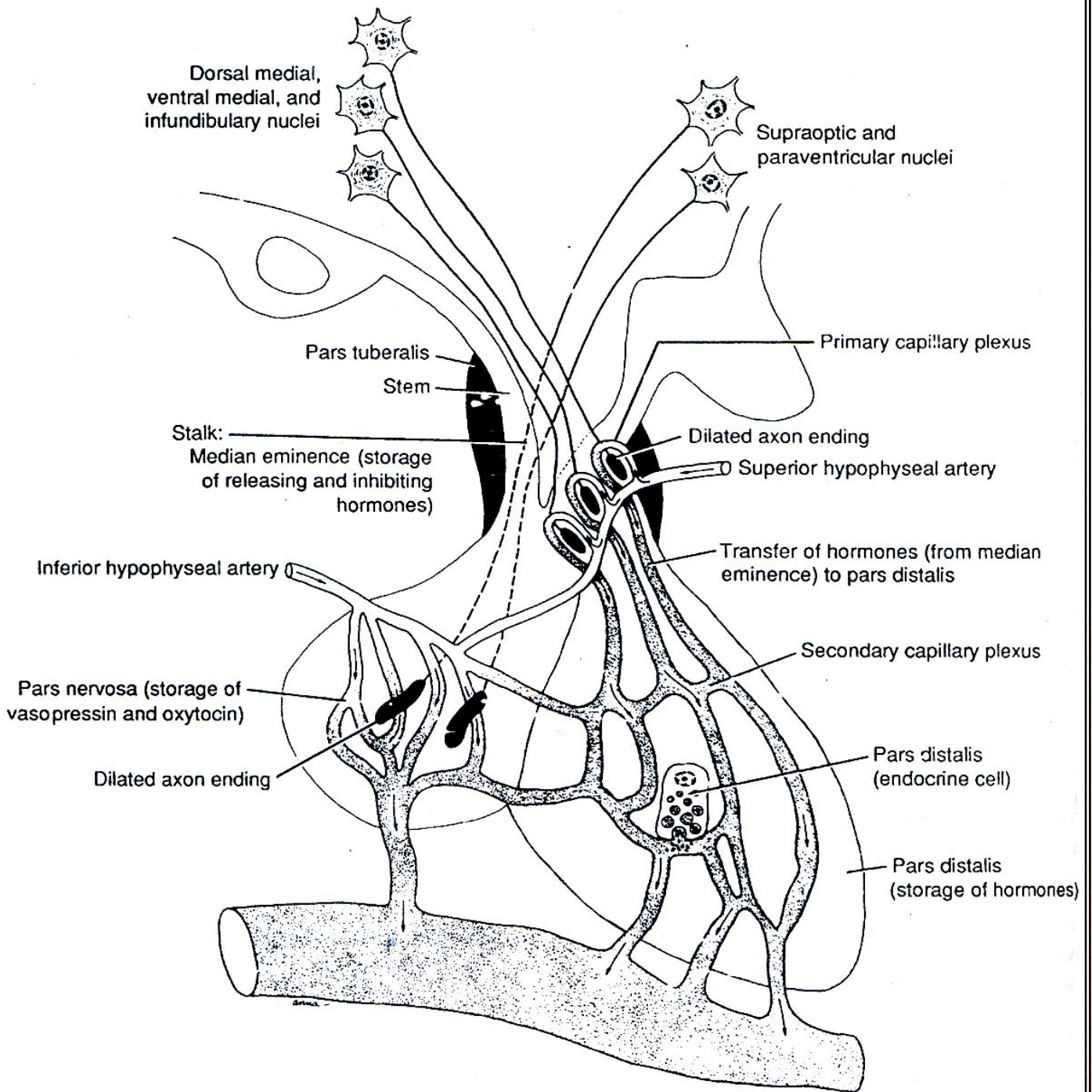


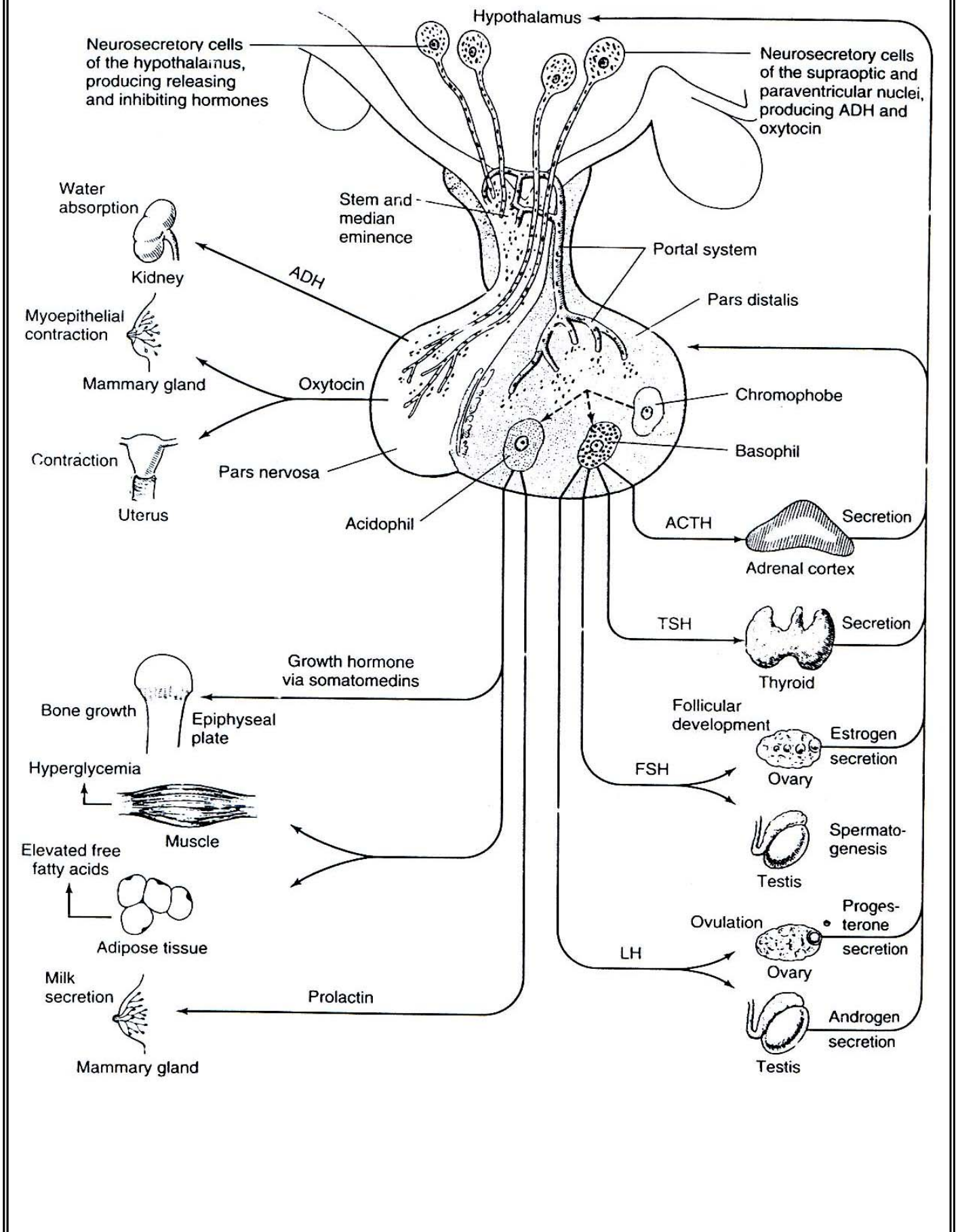
BERBAGAI KELENJAR ENDOKRIN



➤ AKSIS HIPOTALAMO – HIPOFISEOS



➤ HORMON-HORMON HIPOFISE



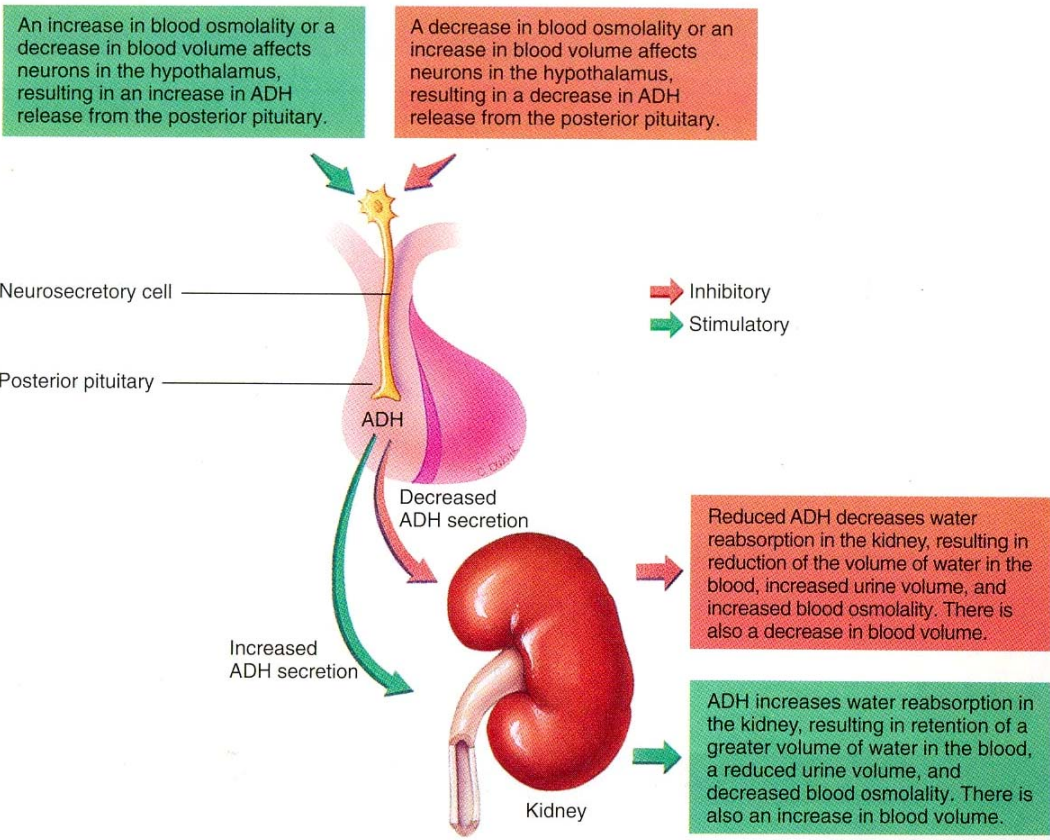
Tabel 1. Hormon-hormon hipotalamus

Hormon	Struktur	Sasaran	Aksi
TRH	Peptida	Sel-sel adenohipofisis pensekresi TSH	↑ sekresi TSH
GHRH	Peptida pendek	Sel-sel adenohipofisis pensekresi GH	↑ sekresi GH
GHIH	Peptida pendek	Sel-sel adenohipofisis pensekresi GH	↓ sekresi GH
CRH	Peptida	Sel-sel adenohipofisis pensekresi ACTH	↑ sekresi ACTH
GnRH	Peptida pendek	Sel-sel adenohipofisis pensekresi Gn	↑ sekresi Gn
PRH	?	Sel-sel adenohipofisis pensekresi PRL	↑ sekresi PRL
PIH	?	Sel-sel adenohipofisis pensekresi PRL	↓ sekresi PRL

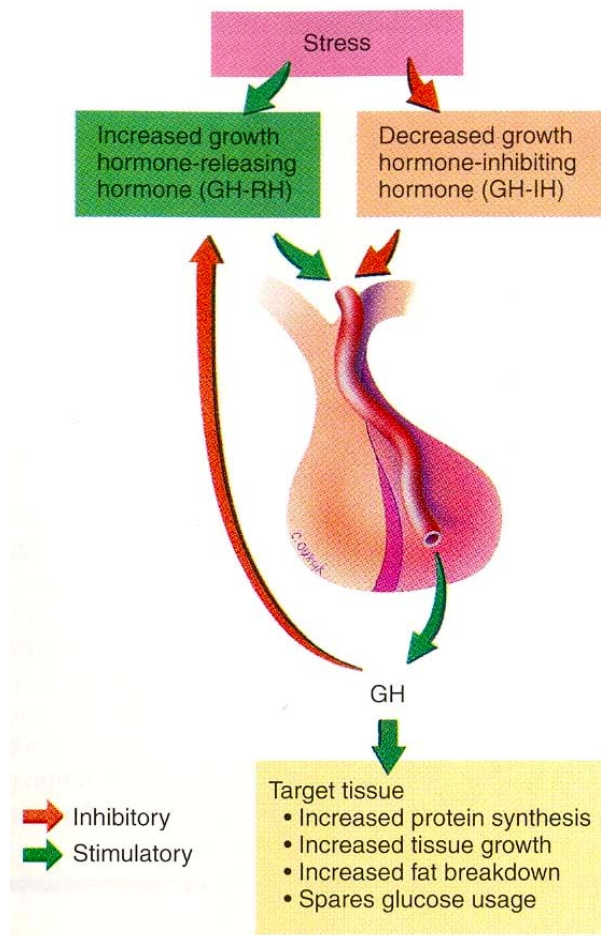
Tabel 2. Hormon-hormon hipofise

Hormon	Struktur	Sasaran	Aksi
Neurohipofise			
ADH	Peptida pendek	Ginjal	↑ reabsorpsi air
Oksitosin	Peptida pendek	Uterus, kelenjar susu	↑ kontraksi uterus, ↑ sekresi susu
Adenohipofise			
GH	Protein	~	↑ pertumbuhan jaringan
TSH	Glikoprotein	Kelenjar tiroid	↑ sekresi hormon tiroid
ACTH	Peptida	Korteks adrenal	↑ sekresi hormon glukokortikoid
Lipotropin	Peptida	Jaringan lemak	↑ pemecahan lemak
β endorfin	Peptida	Otak	analgesia, ↓ sekresi GnRH
MSH	Peptida	Melanosit (kulit)	↑ produksi melanin
LH	Glikoprotein	Ovarium Testis	ovulasi, produksi progesteron sintesis androgen, spermatogenesis
FSH	Glikoprotein	Ovarium Testis	maturasi folikel, sekresi estrogen spermatogenesis
PRL	Protein	Ovarium, kelenjar susu	produksi susu selama laktasi, ↑ respons folikel terhadap LH & FSH

Regulasi hormon-hormon neurohipofise



Regulasi hormon-hormon adenohipofise



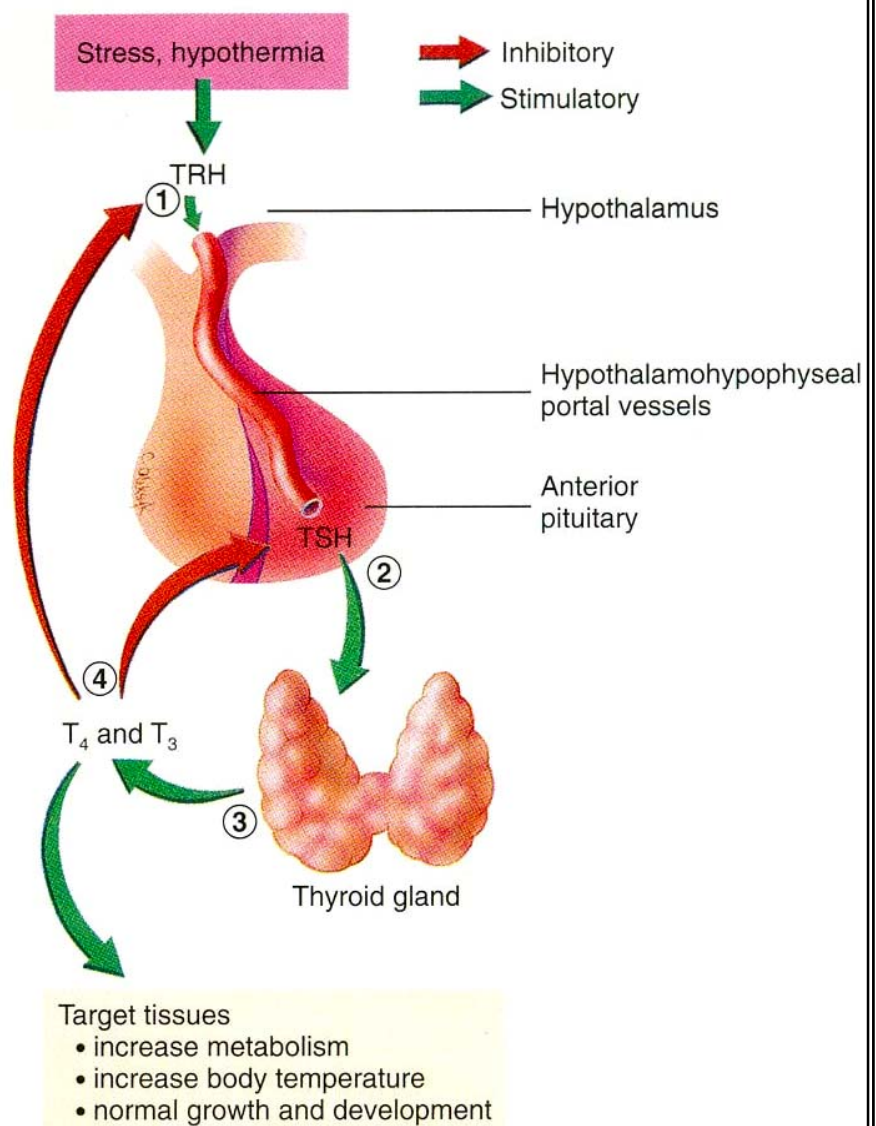
➤ KELENJAR TIROID – PARATIROID

Tabel 3. Hormon-hormon kelenjar tiroid & kelenjar paratiroid

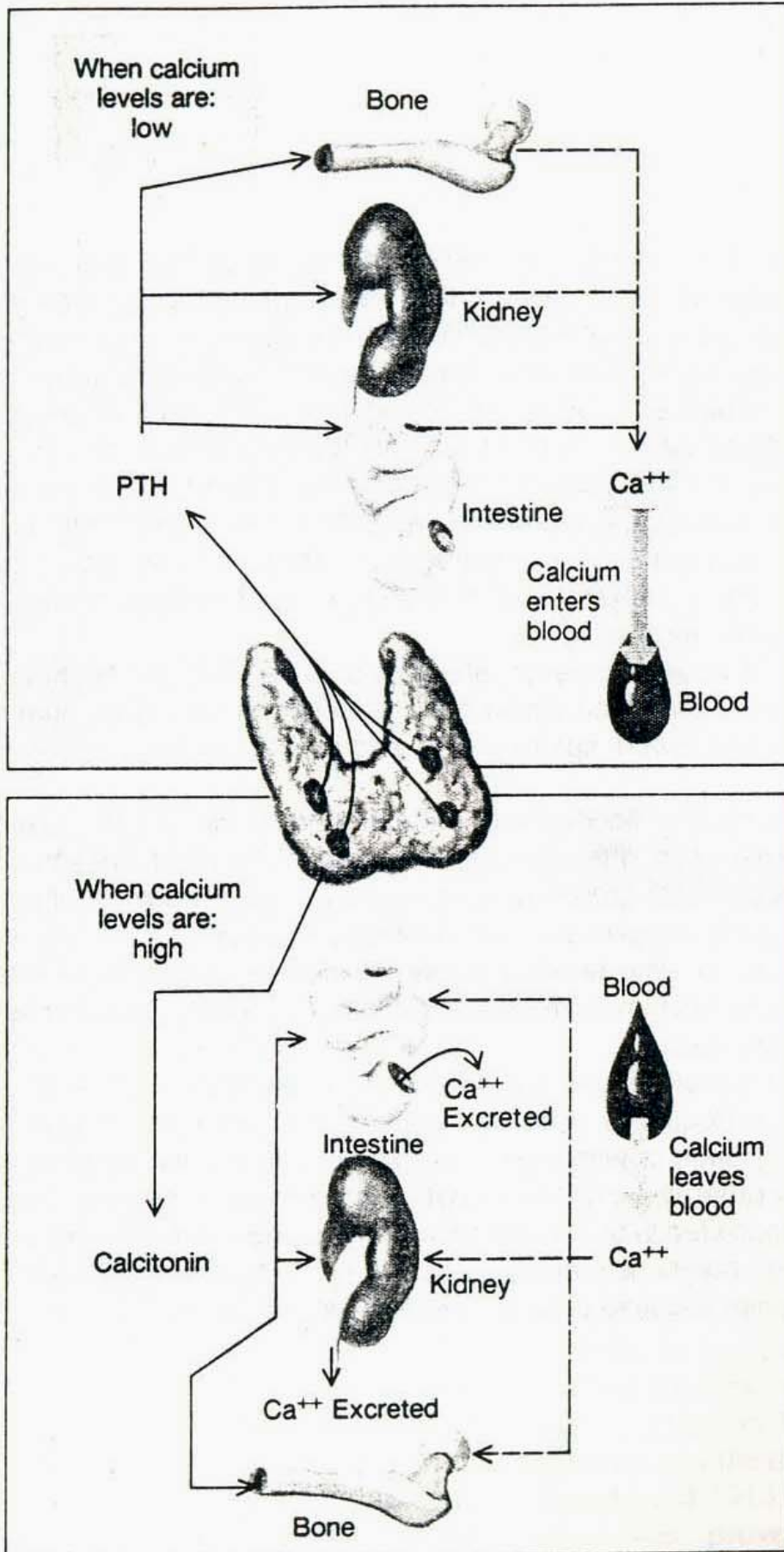
Hormon	Struktur	Sasaran	Aksi
Kelenjar tiroid Sel-sel folikel Hormon tiroid (T ₃ , T ₄)	Asam amino	~	↑ laju metabolisme, esensial untuk pertumbuhan & maturasi normal
Sel-sel parafolikuler Kalsitonin	Polipeptida	Tulang	↓ kadar Ca dalam darah
Kelenjar paratiroid PTH	Peptida	Tulang, ginjal, usus halus	↑ kadar Ca dalam darah, ↓ kadar P dalam darah ↑ mengaktivasi vit D

Regulasi hormon tiroid

1. Thyroid-releasing hormone (TRH) is released from neurons within the hypothalamus and passes through the hypothalamohypophyseal portal blood vessels to the anterior pituitary.
2. TRH causes cells of the anterior pituitary to secrete thyroid-stimulating hormone (TSH).
3. TSH passes through the general circulation to the thyroid gland, where it causes both increased synthesis and secretion of thyroid hormones (T₃ and T₄).
4. T₃ and T₄ have an inhibitory effect on the secretion of TRH from the hypothalamus and TSH from the anterior pituitary.



Pengaturan keseimbangan Ca dalam darah

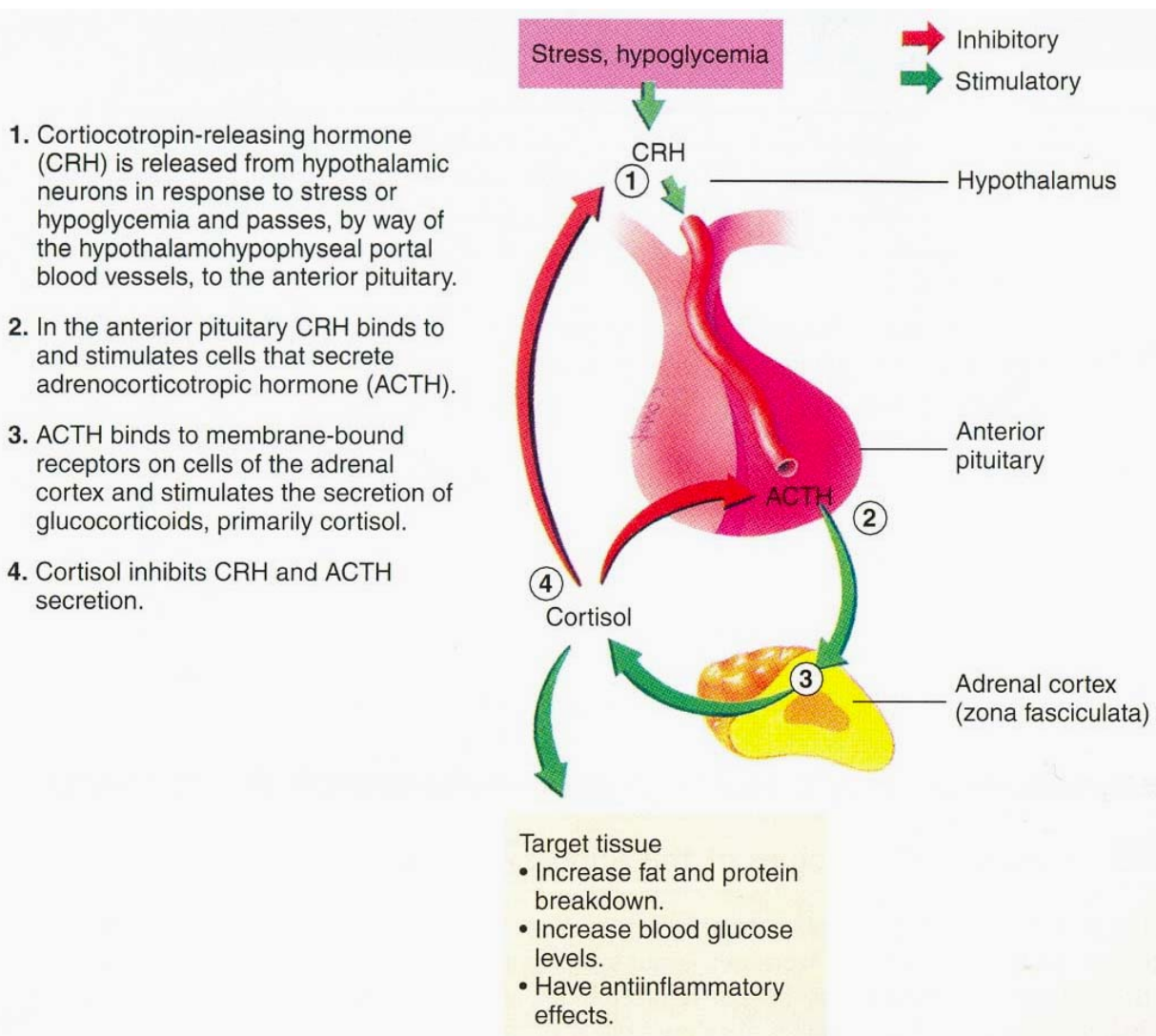


➤ KELENJAR ADRENAL/SUPRARENAL

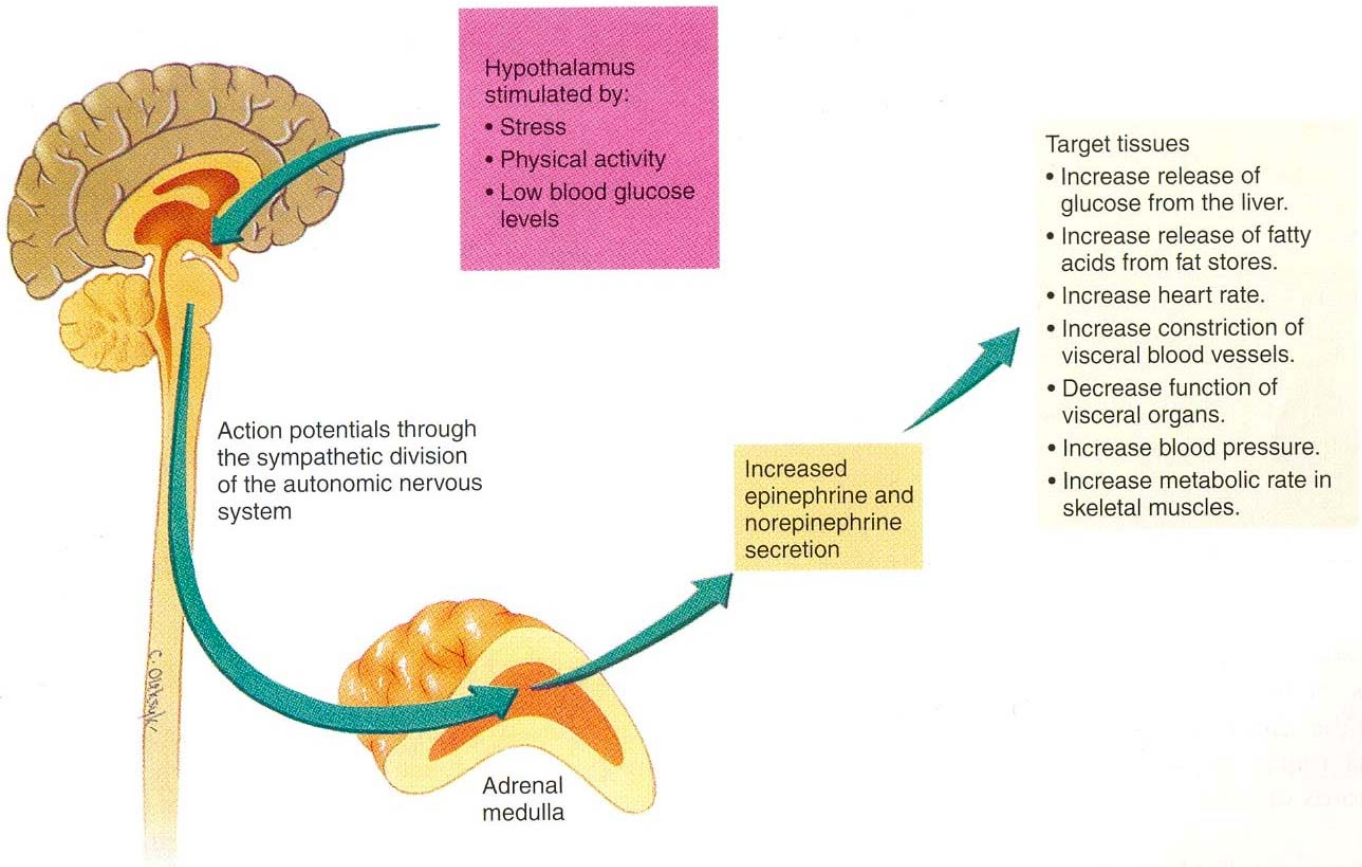
Tabel 4. Hormon-hormon kelenjar adrenal

Hormon	Struktur	Sasaran	Aksi
Korteks Adrenal			
Kortisol (Glukokortikoid)	Steroid	~	↑ kadar gula darah, adaptasi terhadap stress
Aldosteron (Mineralokortikoid)	Steroid	Tubulus ginjal	↑ reabsorpsi Na ⁺ dan sekresi K ⁺ dan H ⁺
Androgen (DHEA)	Steroid	~	pertumbuhan masa pubertas & dorongan seks (♀)
Medulla Adrenal			
Epinefrin, norepinefrin	Asam amino	Otot, jantung, hati, pembuluh darah, jaringan lemak	inisiasi respons terhadap stress & persiapan aktivitas fisik, mengatur tekanan darah

Regulasi hormon korteks adrenal



Regulasi hormon medulla adrenal

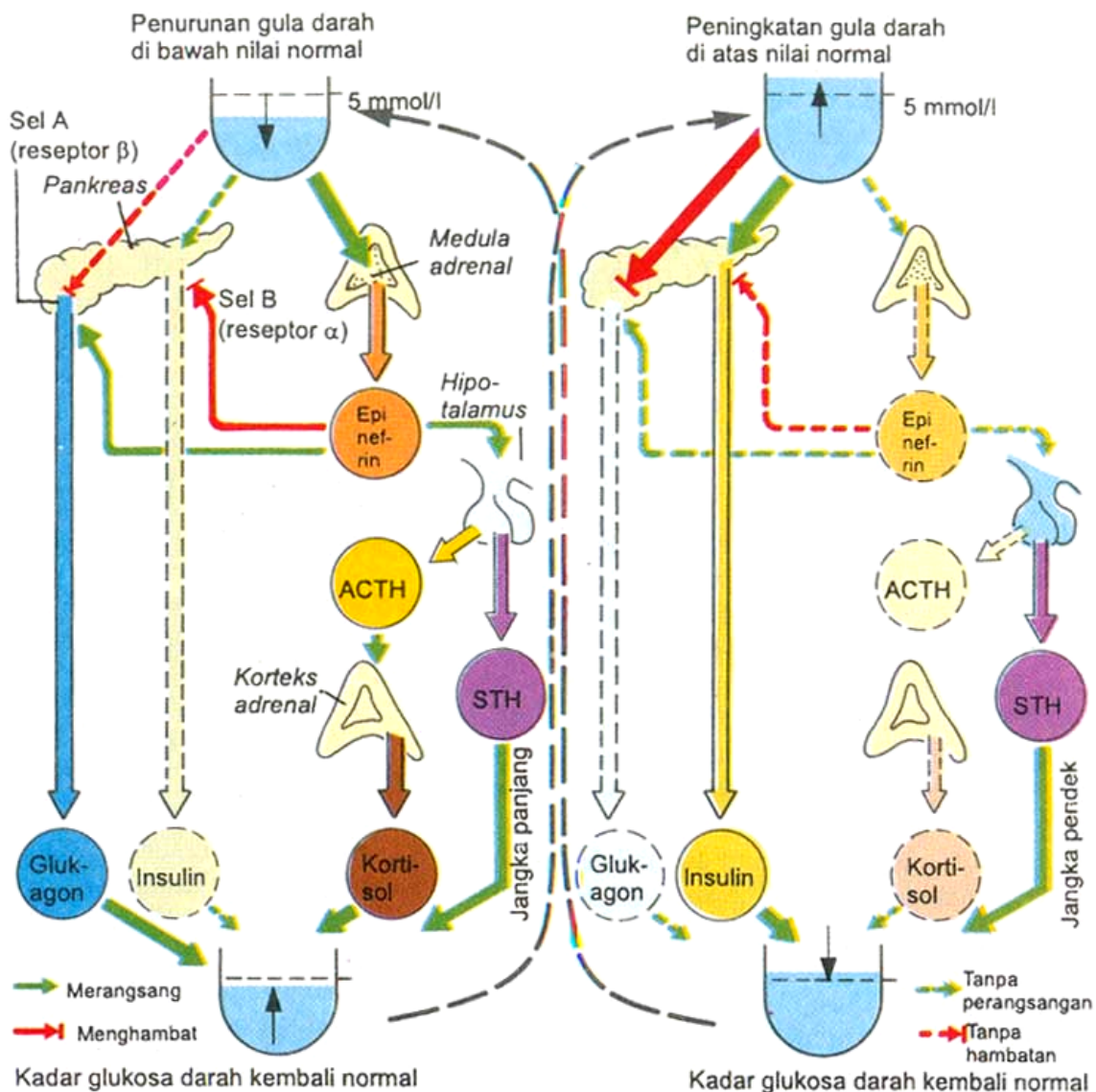


➤ KELENJAR PANKREAS

Tabel 5. Hormon-hormon kelenjar pankreas

Hormon	Penghasil	Struktur	Sasaran	Aksi
Insulin	Sel α	Protein	Hati, otot lurik, jaringan lemak	↓ kadar gula darah, ↑ simpanan glikogen di hati
Glukagon	Sel β	Polipeptida	Hati, otot lurik, jaringan lemak	↑ kadar gula darah, ↓ simpanan glikogen di hati
Somatostatin	Sel δ	Peptida	Sel α & sel β St. Pencernaan	↓ sekresi insulin & glukagon menghambat pencernaan & penyerapan nutrisi

Pengaturan kadar gula darah

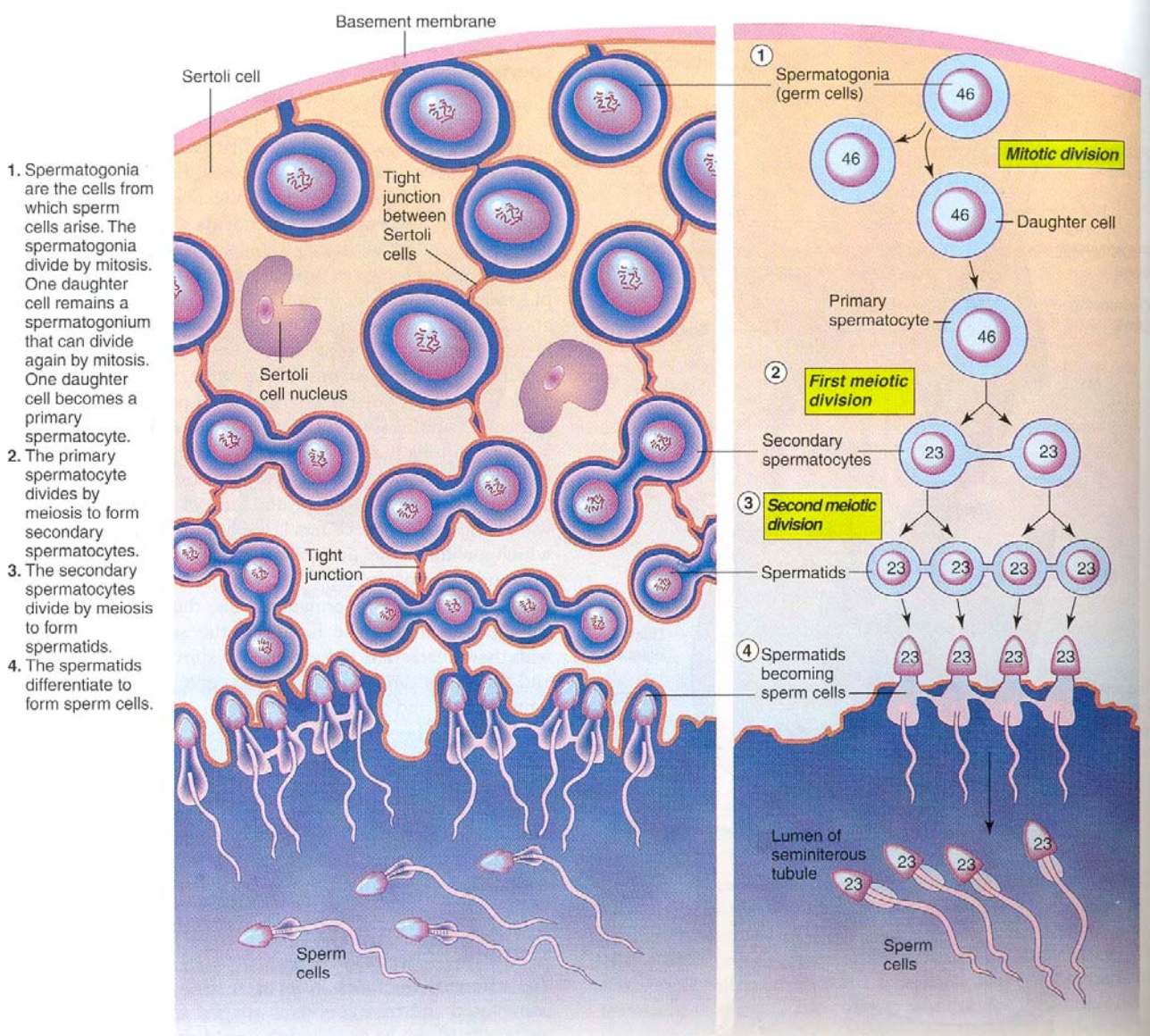


➤ KELENJAR KELAMIN (GONAD)

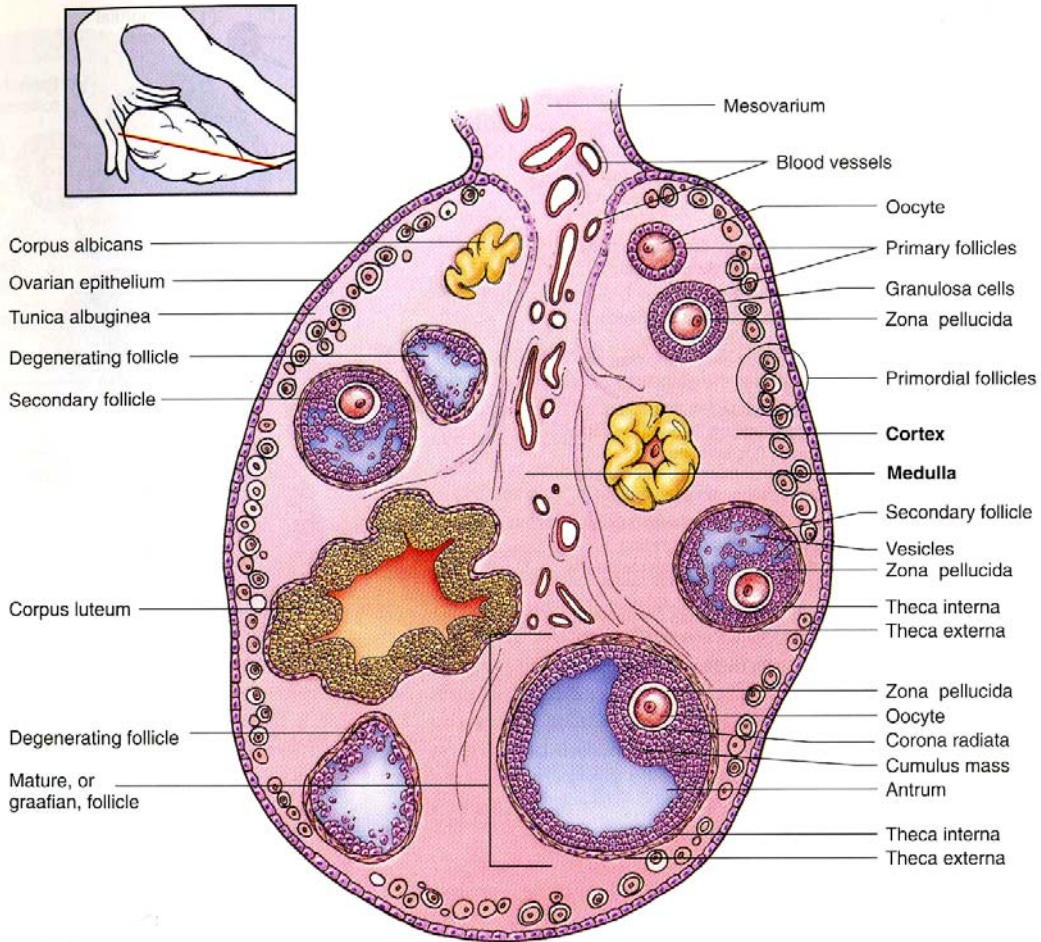
Tabel 6. Hormon-hormon kelenjar reproduksi

Hormon	Struktur	Sasaran	Aksi
Testis Androgen	Steroid	~	Spermatogenesis, mempertahankan fungsi organ reproduksi, ciri kelamin sekunder, perilaku seksual
Ovarium Estrogen	Steroid	~	Perkembangan & fungsi uterus dan kelenjar susu, struktur genitalia eksterna, ciri kelamin sekunder, perilaku seksual, siklus menstruasi
Progesteron	Steroid	~	Perkembangan & fungsi uterus dan kelenjar susu, struktur genitalia eksterna, ciri kelamin sekunder, siklus menstruasi

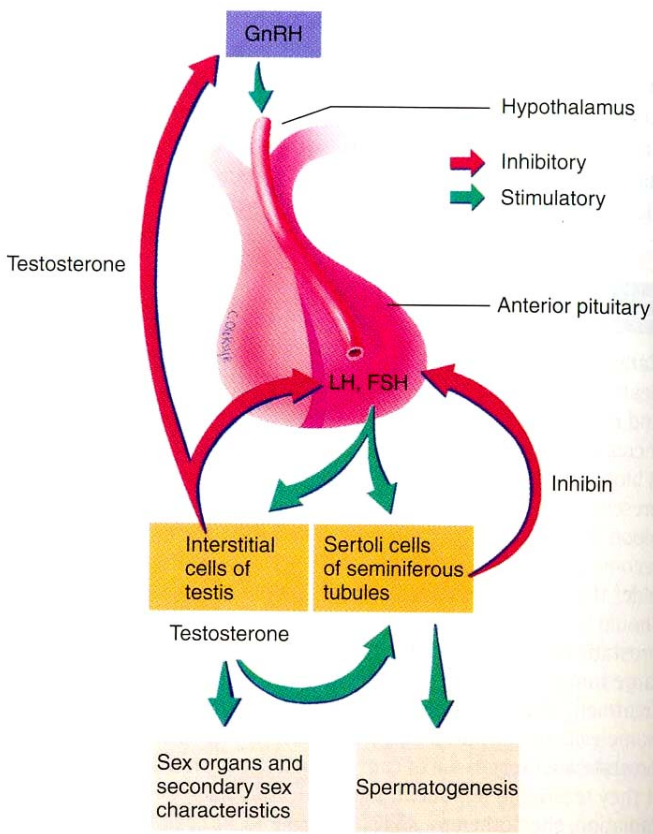
Spermatogenesis



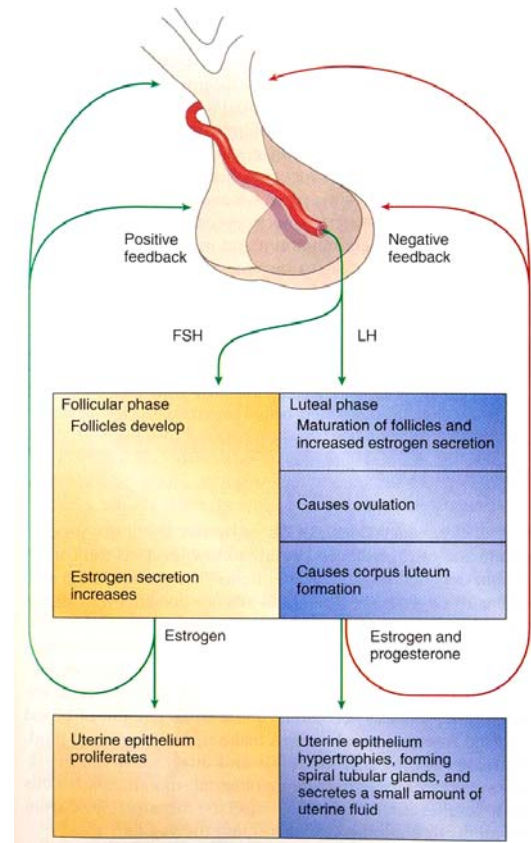
Oogenesis



Regulasi hormon jantan

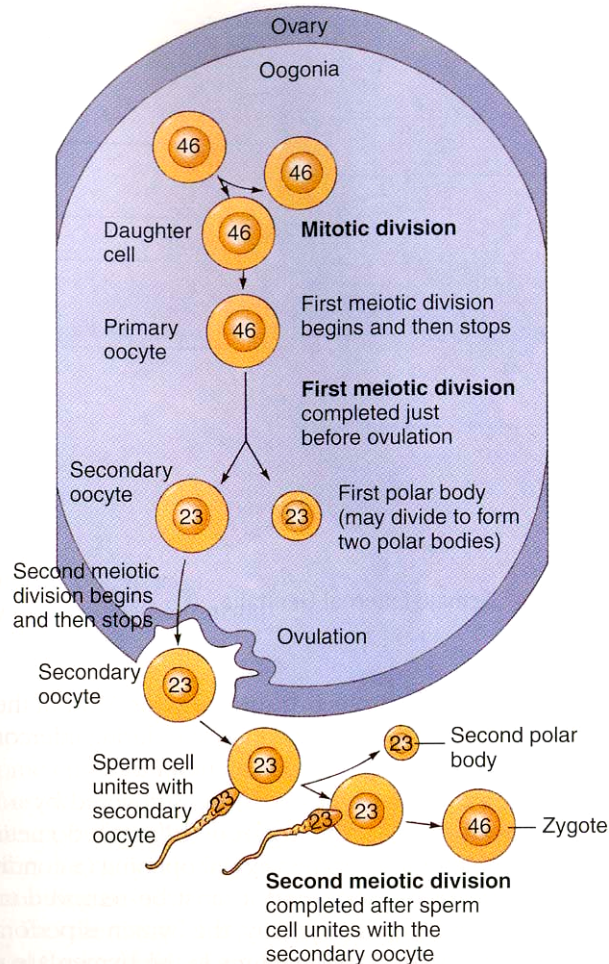
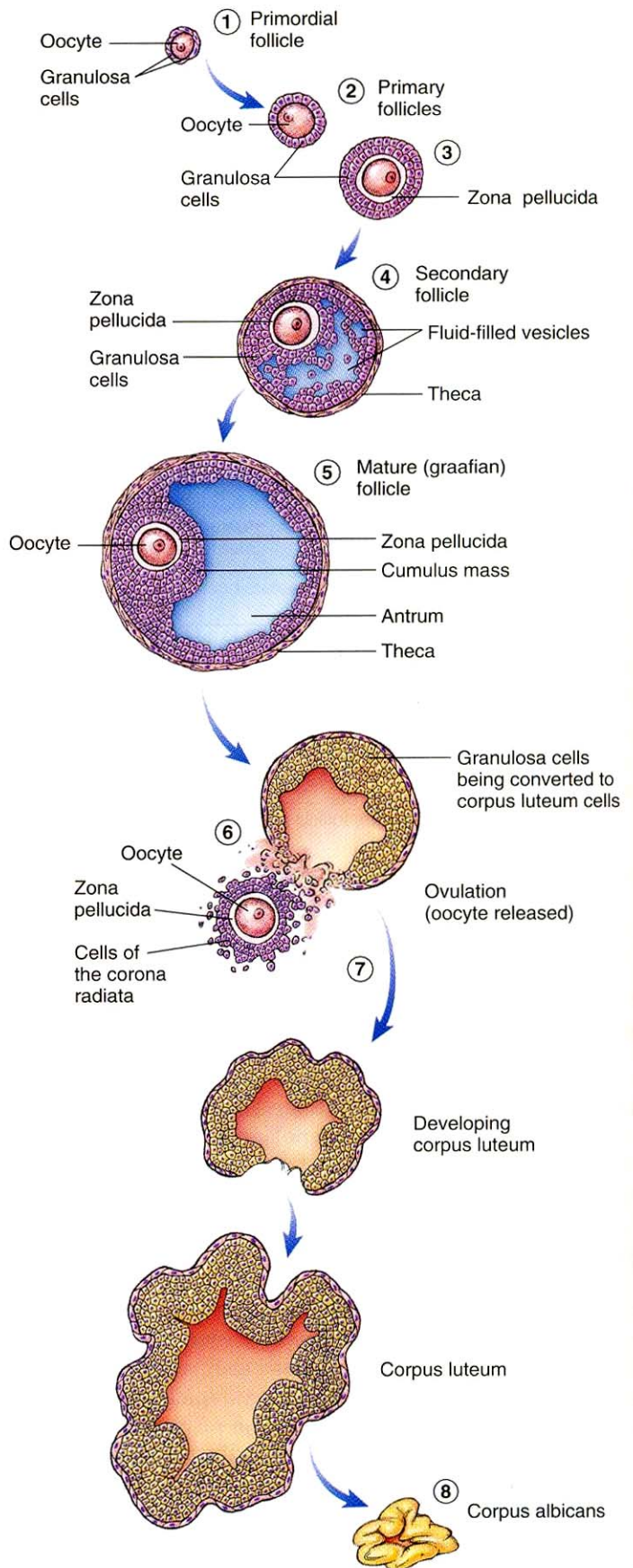


Regulasi hormon betina

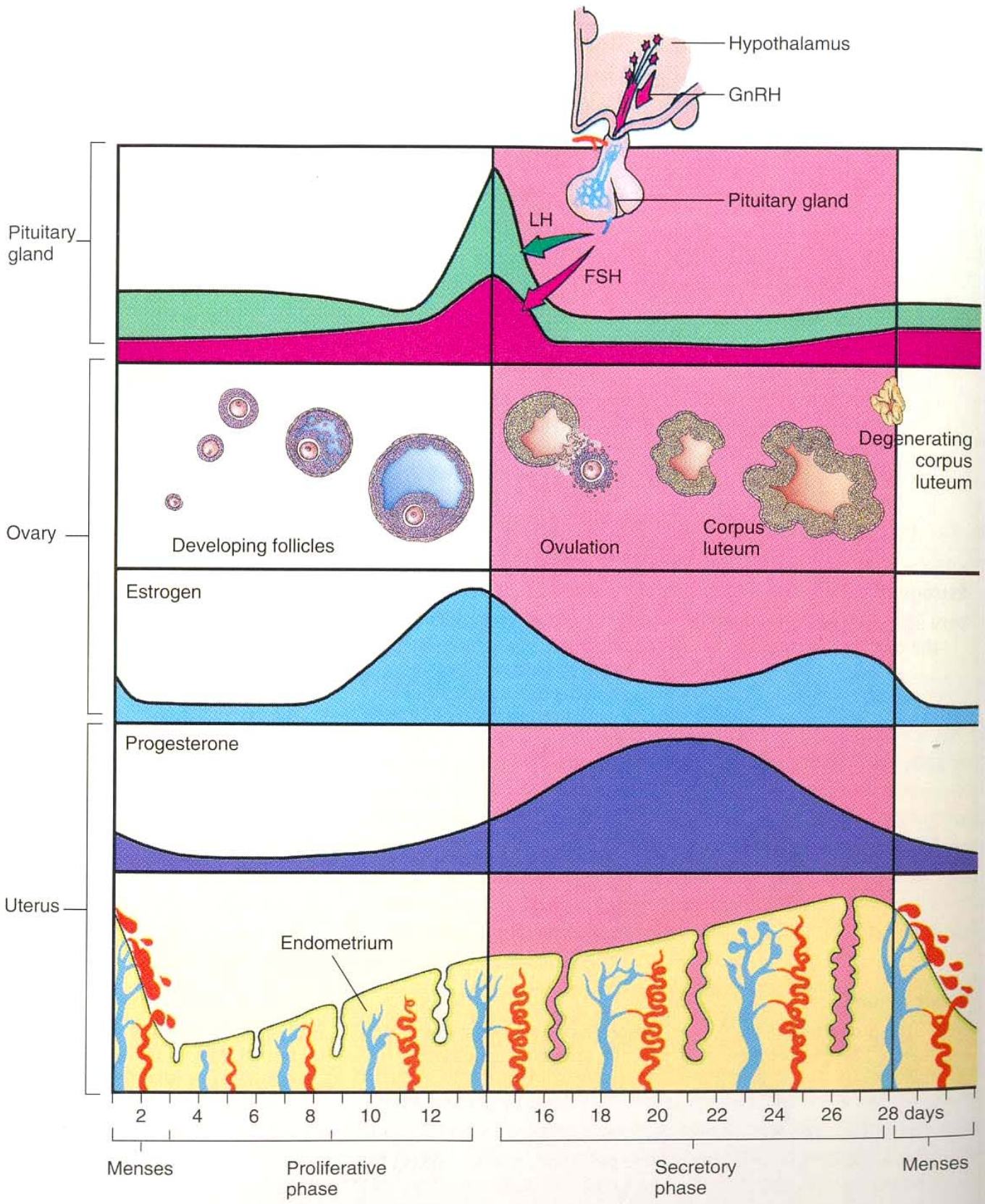


Oogenesis

1. The primordial follicle consists of an oocyte surrounded by a single layer of squamous granulosa cells.
2. A primordial follicle becomes a primary follicle as the granulosa cells become enlarged and cuboidal.
3. The primary follicle enlarges. Granulosa cells form more than one layer of cells. The zona pellucida forms around the oocyte.
4. A secondary follicle forms when fluid-filled vesicles (spaces) develop among the granulosa cells and a well developed theca becomes apparent around the granulosa cells.
5. A mature follicle forms when the fluid-filled vesicles form a single antrum. When a follicle becomes fully mature, it is enlarged to its maximum size, a large antrum is present, and the oocyte is located in the cumulus mass.
6. During ovulation the oocyte is released from the follicle, along with some surrounding granulosa cells of the cumulus mass called the corona radiata.
7. Following ovulation, the granulosa cells divide rapidly and enlarge to form the corpus luteum.
8. When the corpus luteum degenerates, it forms the corpus albicans.



Regulasi hormon betina



➤ LAIN-LAIN

Tabel 7. Hormon-hormon lain dan substansi *hormonlike*

Hormon	Struktur	Sasaran	Aksi
Badan pineal Melatonin	Asam amino	Hipotalamus	↓ sekresi GnRH
Arginin vasotocin	Asam amino	Hipotalamus	↓ sekresi GnRH
Timus Timosin	Peptida	Jaringan imun	Perkembangan & fungsi sistem imun
Hormonlike Prostaglandin	Asam lemak	~	Mediasi respons inflamasi, ovulasi, ↑ kontraksi uterus, ↓ progesteron, koagulasi darah
Prostasiklin	Asam lemak	~	Mediasi respons inflamasi
Tromboksan	Asam lemak	~	Mediasi respons inflamasi
Leukotrin	Asam lemak	~	Mediasi respons inflamasi
Enkephalin, endorfin, dynorfin	Peptida	Sistem syaraf	Analgesia