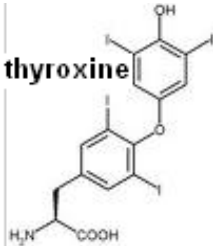
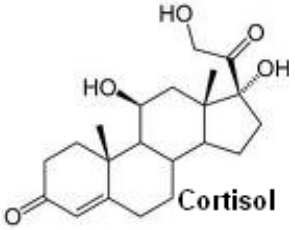


INTRO TO ENDOCRINE SYSTEM



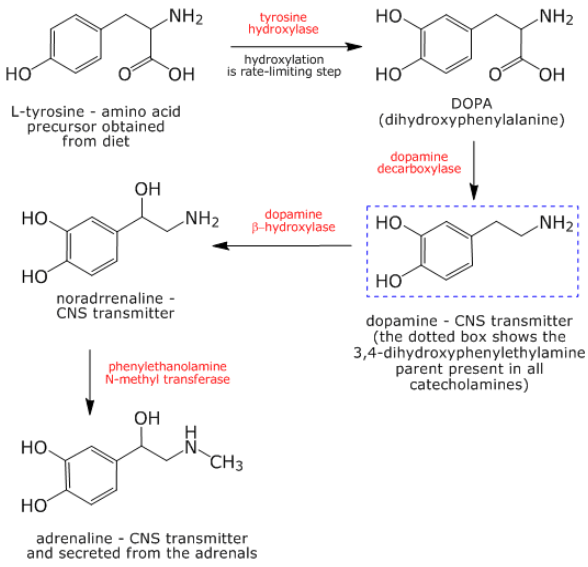
revised 02Feb2016
Marieb P 540, Martini, P. 602, 6th: 605-, 7th: 591-600, 8th: 604-614, 10th: 608-619

Endocrine: (p. 611-612) ductless glands, maintain **homeostasis**, secrete hormones, interconnected with the nervous system by hypothalamus (a neuroendocrine organ)

Three kinds of hormones: (p 613)

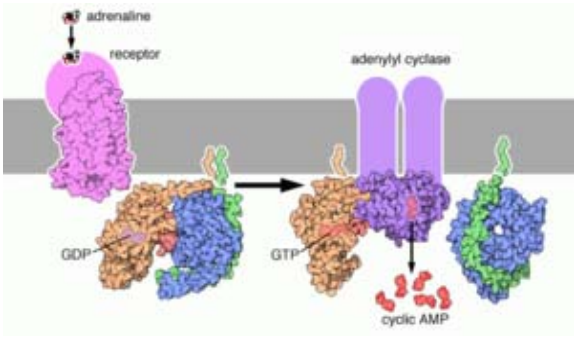
hormone class	nature, example	site of action	administered
amino acid derivatives	catecholamines: epinephrine, norepinephrine, dopamine thyroxine melatonin	either membrane or nucleus	orally
peptides (stomach can digest)	chain of amino acids, insulin, etc	membrane receptors	parenterally
steroid, lipids	cholesterol backbone or prostaglandins, etc	penetrate to nucleus	orally

hormones (first messenger) acts on **target cells**' specific surface receptors



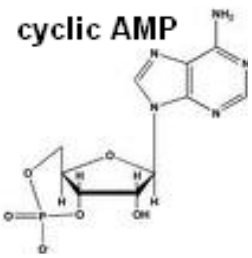
Interaction affects cell activity by 5 mechanisms, 2nd internal messenger:

1 **change membrane permeability** antidiuretic hormone
2 gene activation, **trigger protein synthesis** growth hormone
3 **regulate enzyme activity** thyroxine on mitochondria
4 **induce secretion** gastrin
5 **stimulate mitosis** thyroid stimulating horm.



Second messenger system (p. 610) binds to receptor, activates G protein

adjusts cAMP conc, intracellular messenger:
increase: G protein activates **adenylate cyclase** : ATP to **cyclic AMP** (ADH, FSH, LH, TSH)
decrease: G protein enhances breakdown of cAMP (α_2 nor- and adrenaline receptors)
increase Ca^{++} levels, acts as second messenger (oxytocin, α_1 nor- and adrenaline receptors)



80% prescription drugs target G protein-coupled receptors

Steroids & thyroxine bind to nuclear receptors, regulate gene activity (or mitochondrion) (p 612)

Homeostasis by negative feedback system
positive stimulus may be hormonal (from anterior pituitary)
humoral (from blood as in parathormone)
neural (from CNS as in adrenal medulla)