AUTONOMIC NERVOUS SYSTEM

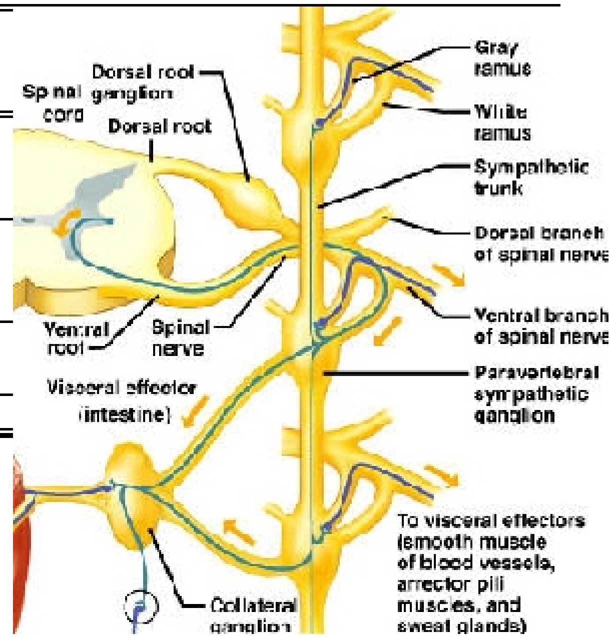
26 Jan 1995, 30 Jan '97, 29 Jan 98, 3 Feb 03, 31 Jan 05, 4 Feb 08, 2Feb09, 1Feb10, 31Jan11
EM p. 457-, Martini's 5th: 504-525 Martini's 6^{th}: 533-552, 8^{th}: 528-546, 9^{TH}: 516-545

ANS (p 530) is ultimately **controlled by the hypothalamus** and enervates smooth & cardiac muscles as well as glands. It acts to ration the body's energy by shunting blood, altering secretions, etc.

Parasympathetic	"**Feed or breed**" regulates digestive functions, enhances digestion and absorption.
Sympathetic	"**Fight or flight**" favors physical activity

OVERVIEW: both have
1) a preganglionic neuron in the Central Nervous System releases acetylcholine
2) a post ganglionic neuron in the Peripheral Nervous System, releases noradrenaline or acetylcholine

generalized feature:	**Sympathetic features: (p. 535) (thoracolumbar division)**	**Parasympathetic features: (craniosacral division) (p 540)**
preganglionic neuron (in Central NS)	lateral grey horns	hypothalamus, brain stem or sacral lateral grey horn
post ganglionic neuron (Peripheral NS)	chain ganglia (T_1-L_2) or splanchnic nerve to collateral ganglion	terminal ganglia
post ganglionic neurotransmitter	noradrenaline	acetyl choline
mimicking drug	adrenergic	colinergic



SympatheticPathway (p 533): lateral gray horn, ventral root, white ramus communicans, chain ganglion, then one of three pathways:
1) gray ramus to spinal nerve
2) chain ganglia to other ganglion and spinal nerve, **or**
3) unsynapsed via **splanchnic nerve** to **collateral ganglion (plexus)** or adrenal medulla.

EFFECTS (p 544 &545)

ORGAN	**Sympathetic trait or effect**	**Parasympathetic:**
heart, respiration	increase rate and pressure	reduce rate and pressure
arrector pili	contract	no effect
GI tract	decrease secretion and motility	stimulate peristalsis, secretion
bronchioles	dilate	constrict
bladder, anal and urinary sphincters	relax	constrict
pupil	dilate (radial muscles contract)	constrict (circular muscles)
ciliary muscle	relax (focus far away)	no effect
adrenal medulla	stimulate	no effect
sweat glands	stimulate	no effect
GI tract	inhibit peristalsis	stimulate peristalsis
liver	increase glucose release	glycogen synthesis
arteries to skel muscles	dilate	
arteries to viscera and skin, veins	constrict	
lacrimal glands		secrete
reproductive organs	male: ejaculation, female: uterus contracts	male: erection