

MODULE 1 L06

Adrenal Gland

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6. Adrenal (Suprarenal) Gland

- Divided structurally and functionally:

A. Adrenal cortex

B. Medulla

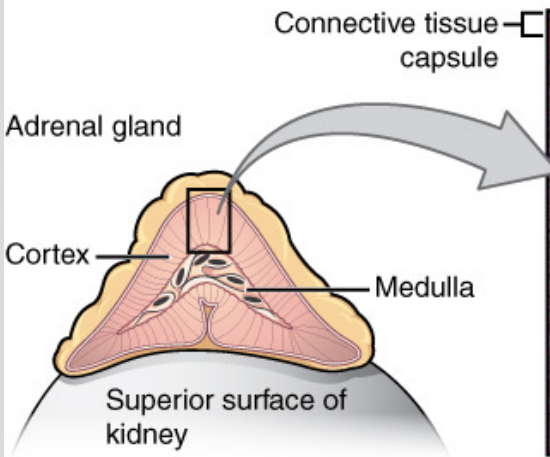
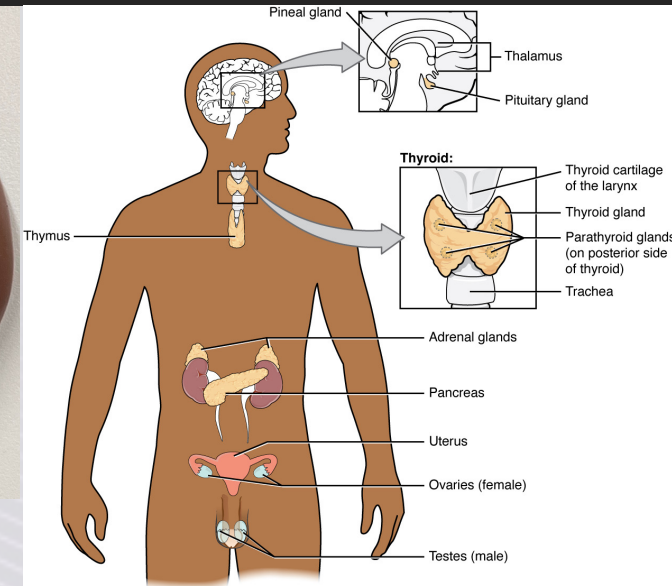
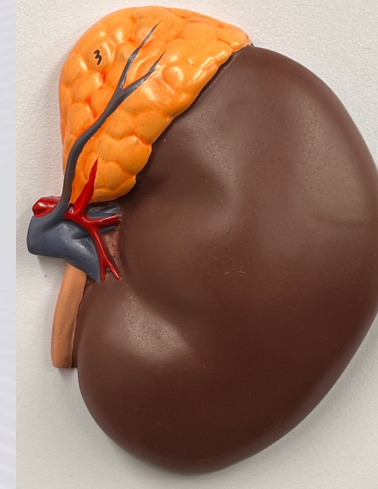
- Yellowish color:

❖ Stored lipids

- Hypothalamus – CRH

❖ Anterior pituitary – ACTH

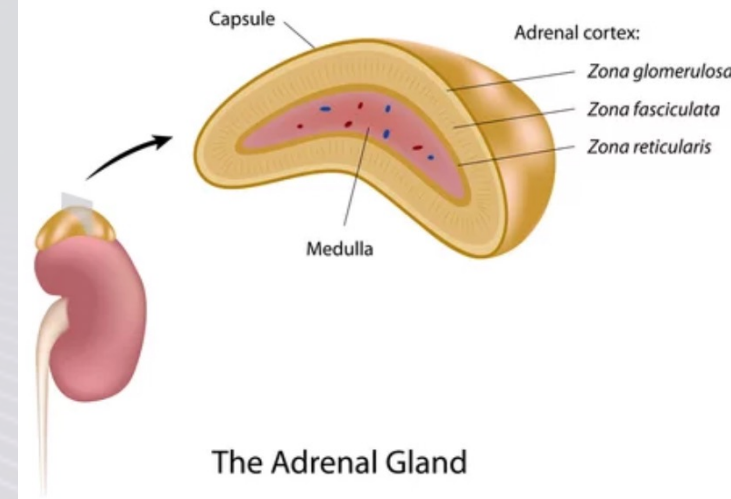
- Targets the adrenal gland to secrete hormones



Tissue area	Hormones released	Examples
Zona glomerulosa (adrenal cortex)	Mineralcorticoids (regulate mineral balance)	Aldosterone (ALD)
Zona fasciculata (adrenal cortex)	Glucocorticoids (regulate glucose metabolism)	Cortisol Corticosterone Cortisone
Zona reticularis (adrenal cortex)	Androgens (stimulate masculinization)	Dehydroepiandrosterone (DHEA)
Adrenal medulla	Stress hormones (stimulate sympathetic ANS)	Epinephrine Norepinephrine

A. Adrenal Cortex

- Hormone production
 - ❖ More than two dozen
 - Adrenocortical steroids (corticosteroids)
- Divided structurally and functionally:
 - ❖ Zona glomerulosa
 - Aldosterone
 - Targets kidney cells that regulate ionic urine composition
 - Retention of Na⁺ and water
 - Loss of K⁺
 - ❖ Zona fasciculata
 - Glucocorticoids (stimulated by ACTH)
 - Cortisol - liver converts cortisol into cortisolone
 - Corticosterone
 - ❖ Zona reticularis
 - Androgens (sex hormones)
 - Prior to puberty – pubic hair
 - Adult males: not important
 - Adult females: promote muscle mass, stimulate blood cell formation and support libido



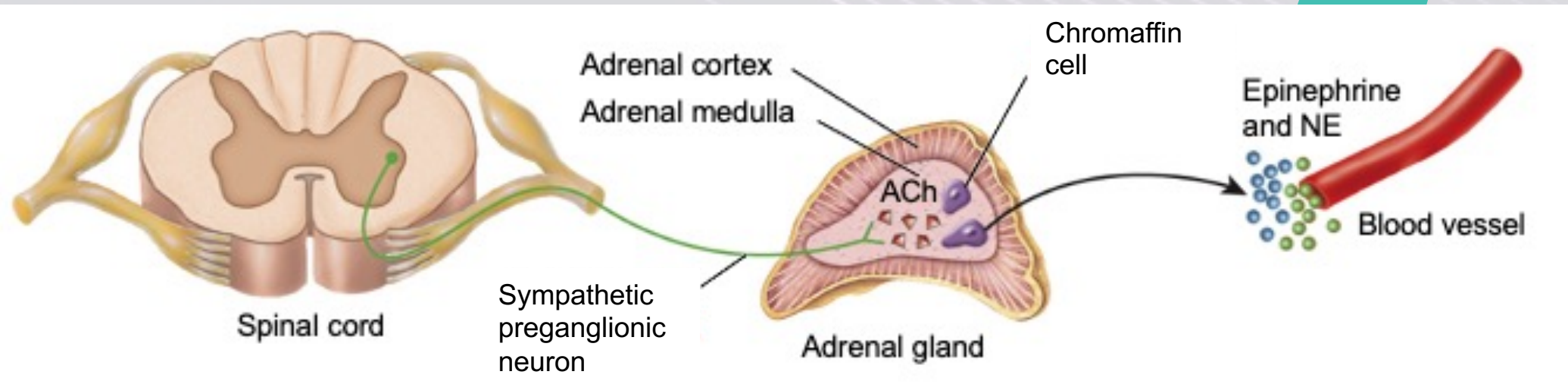
Regulates body's stress response
Regulates metabolism
Suppresses inflammation
Regulates blood pressure
Regulates blood sugar
Helps to control your sleep-wake cycle

B. Adrenal Medulla

- Contain chromaffin cells that are innervated by preganglionic sympathetic fibers that secrete:
 - ❖ Epinephrine (adrenaline)
 - ❖ Norepinephrine (noradrenaline)
 - Triggers:
 - Cellular energy utilization
 - Mobilization of energy reserves

“Fight or Flight”

Increases muscular strength and endurance



Stress Response to Cortisol

- General Adaptation Syndrome (GAS)
 1. Alarm reaction
 2. Stage of resistance
 3. Stage of exhaustion
- Physiological changes supporting fight or flight responses
 - ❖ Liver – converts glycogen to glucose
 - ❖ Blood vessels – increased blood pressure
 - ❖ Sweat glands – increased sweating
 - ❖ Lungs – fast breathing
 - ❖ Heart – accelerated heart rate
 - ❖ Digestive – digestion slows down
 - ❖ Eye – tunnel vision

