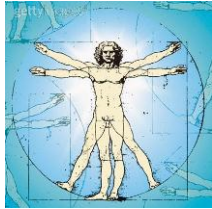


BIGL 164  
**Human Biology**  
 Ch 10 Endocrine System




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**Ch. 10 – The Endocrine System**

- Endocrine System
  - endocrine glands
    - and endocrine tissues within some organs
    - secrete **hormones** (chemical messengers)
      - effect target cells elsewhere in the body
  - Receptors on **target cells** for a particular hormone
    - specifically recognize/bind to that hormone
- Controls coordinated, widespread activities
  - and gradual, sustained, long-term processes (maintaining homeostasis)
  - E.g. metabolism, growth, development, reproduction, etc.




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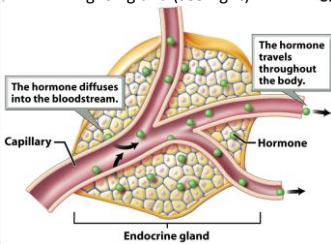
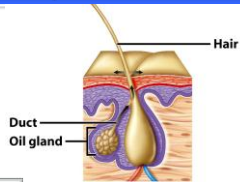
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**Exocrine vs. endocrine glands**

• **Exocrine glands** – secrete products through *ducts* to open space

- E.g. oil gland (see right)



• **Endocrine glands** – secrete hormones into bloodstream (see left)

- No ducts

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## Endocrine glands and their hormones

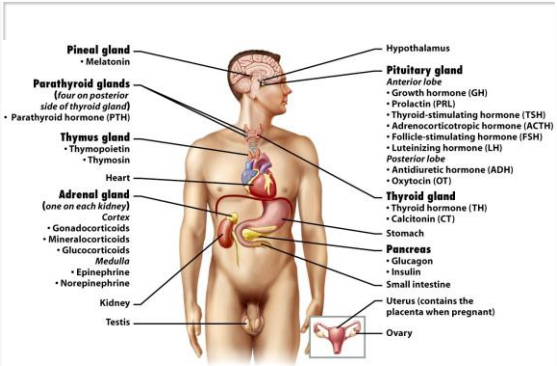


Figure 10-2 Biology of Humans, 2/e  
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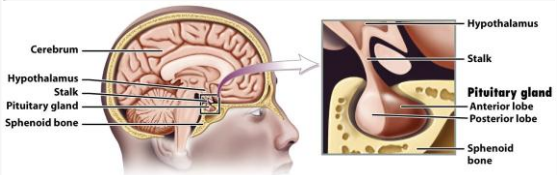
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## Pituitary gland



GLAND OR ORGAN	HORMONE	FUNCTION
Anterior lobe of pituitary	Growth hormone (GH)	Stimulates growth, particularly of muscle, bone, and cartilage Stimulates breakdown of fat
	Prolactin (PRL)	Stimulates breasts to produce milk
	Thyroid-stimulating hormone (TSH)	Stimulates synthesis and release of hormones from thyroid gland
	Adrenocorticotrophic hormone (ACTH)	Stimulates synthesis and release of glucocorticoid hormones from adrenal glands
	Follicle-stimulating hormone (FSH)	Stimulates gamete development in males and females Stimulates secretion of estrogen by the ovaries
	Luteinizing hormone (LH)	Causes ovulation and stimulates ovaries to secrete estrogen and progesterone Stimulates cells of testes to develop and secrete testosterone
Posterior lobe of pituitary	Antidiuretic hormone (ADH)	Promotes water reabsorption by the kidneys
	Oxytocin (OT)	Stimulates milk ejection from the breasts Stimulates uterine contractions during childbirth

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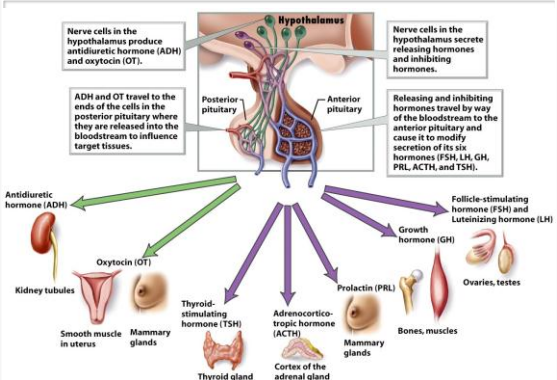
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## Hypothalamus-pituitary relationship




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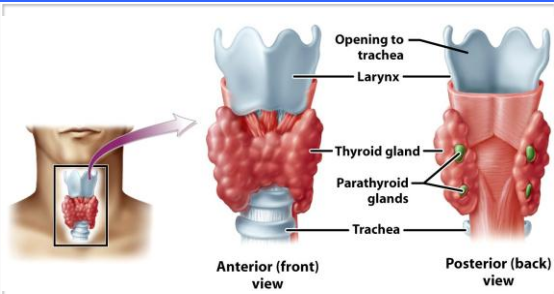
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## Thyroid and parathyroid glands



GLAND OR ORGAN	HORMONE	FUNCTION
Thyroid	Thyroid hormone (T <sub>4</sub> )	Regulates metabolism and heat production Promotes normal development and functioning of nervous, muscular, skeletal, and reproductive systems
Parathyroid	Calcitonin (CT) Parathyroid hormone (PTH)	Decreases blood levels of calcium (stimulates absorption of calcium by bone) Increases blood levels of calcium (stimulates breakdown of bone and rate at which calcium is removed from urine and absorbed from gastrointestinal tract)

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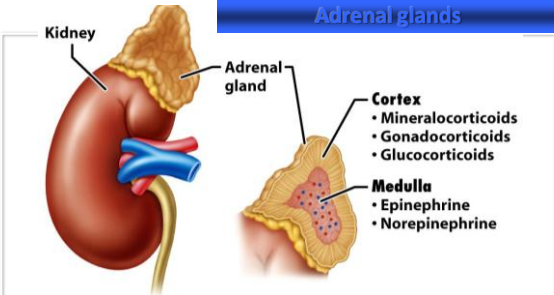
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## Adrenal glands



GLAND OR ORGAN	HORMONE	FUNCTION
Adrenal cortex	Gonadocorticoids (androgens, estrogens) Mineralocorticoids (aldosterone) Glucocorticoids (cortisol, corticosterone, cortisone)	Amounts secreted by adults are so low that effects are probably insignificant Increase sodium reabsorption by kidneys Increase potassium excretion by kidneys Stimulate glucose synthesis Inhibit the inflammatory response
Adrenal medulla	Epinephrine Norepinephrine	Fight-or-flight response Short-term response to stress Fight-or-flight response

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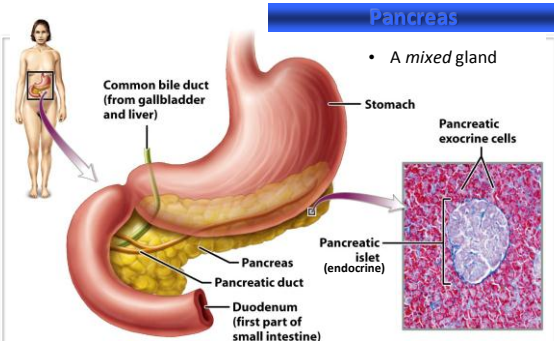
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## Pancreas



GLAND OR ORGAN	HORMONE	FUNCTION
Pancreas	Glucagon Insulin	Increases blood glucose level (prompts liver to increase conversion of glycogen to glucose and formation of glucose from fatty and amino acids) Decreases blood glucose level (stimulates transport of glucose into cells, inhibits breakdown of glycogen to glucose, prevents conversion of fatty and amino acids to glucose)

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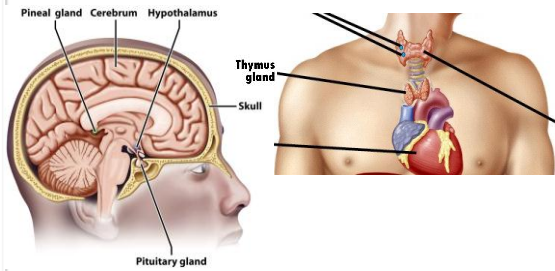
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## Thymus and pineal glands



GLAND OR ORGAN	HORMONE	FUNCTION
Thymus	Thymopoietin, thymosin	Promote maturation of white blood cells
Pineal	Melatonin	Reduces jet lag and promotes sleep

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