

Endocrine Foldable "Answers"

Structure	Function
<p>1. pineal gland</p>	<ul style="list-style-type: none"> • Located deep within the brain. • It produces melatonin which is responsible for regulating circadian rhythms (a person's sleep/wake cycle) and for regulating reproductive hormones. • Exposure to light destroys melatonin and being in the dark increases it and promotes sleep. • Melatonin blocks the secretion of FSH (follicle stimulating hormone) and LH (luteinizing hormone) from being produced by the pituitary. Both of these hormones play a major role in activating the testes and ovaries which is why melatonin plays a role in regulating reproductive cycles.
<p>2. hypothalamus</p>	<ul style="list-style-type: none"> • It is located in the brain above the pituitary gland and it is the size of an almond. • Its main endocrine function is to release hormones to control the activity of the pituitary gland by either stimulating or inhibiting its activity • Hormones produced include: <ol style="list-style-type: none"> 1) TRH (thyrotropin-releasing hormone): causes the pituitary to release TSH (thyroid stimulating hormone) 2) GnRH (gonadotropin-releasing hormone): causes the pituitary to produce more FSH (follicle stimulating hormone) and LH (luteinizing hormone) 3) GHRH (growth hormone-releasing hormone) and GHIH (growth hormone-inhibiting hormone) which controls the pituitary's production of GH (growth hormone) 4) PRH (prolactin releasing hormone) and PIH (prolactin inhibiting hormone) which controls the pituitary's production of prolactin (PRL) 5) CRH (corticotropic-releasing hormone): causes the pituitary to release ACTH (adrenocorticotropic hormone) 6) somatostatin: inhibits the pituitary from producing GH and TSH 7) dopamine: inhibits the production of PRL (prolactin) from the pituitary 8) vasopressin/antidiuretic hormone (ADH) and oxytocin are produced in the hypothalamus but released in the pituitary to effect other parts of the body. ADH causes the kidneys to reabsorb water. Oxytocin causes uterine contractions during labor and causes milk production.

3. pituitary gland	<ul style="list-style-type: none">• This is a gland that dangles at the base of the brain and is the size of a pea. It is called the “master” gland because it produces so many hormones that control other organs of the body.• It is influenced by the secretions of the hypothalamus that lies above it.• It has two distinct regions called the anterior pituitary/lobe and the posterior pituitary/lobe.• <u>Posterior Lobe</u>: it does not produce its own hormones but it allows the hypothalamus to release oxytocin and vasopressin/ADH through this lobe of the pituitary.• <u>Anterior Lobe</u> hormones produced are:<ol style="list-style-type: none">1) ACTH (adrenocorticotrophic hormone): stimulates the adrenal glands to produce hormones.2) GH (growth hormone): It causes proper body composition and growth from childhood to adulthood. In adults it helps maintain bone and muscle mass as well as affects fat distribution.3) prolactin: stimulates breast milk production4) TSH (thyroid stimulating hormone): cause the thyroid gland to produce hormones.5) FSH (follicle-stimulating hormone): works with LH to ensure normal reproductive functions. In males it stimulates the production of sperm, in females it causes the follicles to release estrogen.6) LH (luteinizing hormone): works with FSH to ensure normal reproductive functions. In males it causes the testes to produce testosterone, in females it triggers ovulation and the production of progesterone from the corpus luteum.7) MSH (melanocyte-stimulating hormone): causes skin to darken as melanin is redistributed on the skin.
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<p>4. thyroid gland</p>	<ul style="list-style-type: none"> • This is a butterfly shaped gland located in front and just below the larynx. • It produces hormones that helps regulate your metabolism and governs how you use energy, consume oxygen and produce heat. • It produces two main hormones: T3 (triiodothyronine) and T4 (thyroxine). A healthy thyroid produces roughly 80% T4 and 20% T3 though T3 is the more potent hormone. • The synthesis of T3 and T4 require the uptake of iodine. • A lesser hormone produced is calcitonin which helps control blood calcium levels. • The activity of the thyroid is controlled by both the hypothalamus and the pituitary. The hypothalamus secretes TRH (thyroid releasing hormone) which triggers the pituitary to secrete TSH (thyroid stimulating hormone) which cause the thyroid to produce more of its hormones.
<p>5. parathyroid glands</p>	<ul style="list-style-type: none"> • These four glands are located behind the thyroid gland but have no relation in function to the thyroid. They are each the size of a rice grain. • Their function is to help regulate the levels of available calcium in the body. They produce PTH (parathyroid hormone) which causes bones to release calcium into the blood stream to make it available to cells for use. PTH also increases vitamin D and vitamin D causes the intestines to increase their absorption of calcium from the diet into the bloodstream.
<p>6. thymus</p>	<ul style="list-style-type: none"> • It is located between your lungs and behind your sternum (breast bone) and is only active during puberty after which it begins to atrophy and become fatty. • It produces a hormone called thymosin which stimulates the development and production of T cells (T-lymphocytes) which are white blood cells that protect the body from infections. • The thymus also trains the body not to have an immune response to itself so that it does not develop autoimmune diseases.
<p>7. *heart</p>	<ul style="list-style-type: none"> • Produces ANP (atrial-natriuretic hormone) which reduces blood pressure.
<p>8. *liver</p>	<ul style="list-style-type: none"> • Produces angiotensinogen (active form is called angiotensin) which causes vasoconstriction of blood vessels. • Produces IGF (insulin-like growth factor) which has insulin-like effects and which regulates cell growth and development.

9. *stomach	<ul style="list-style-type: none"> • Produces gastrin which stimulates the release of gastric juices. • Produces somatostatin which inhibits and slows down digestive functions.
10.adrenal glands	<ul style="list-style-type: none"> • There are two adrenal glands and each sits atop a kidney. • The adrenals contain two distinct parts: <ol style="list-style-type: none"> 1) the <u>adrenal cortex</u> is the outer part and it produces: cortisol (a glucocorticoid) which regulates metabolism (directs the conversion and utilization of carbs, fats and proteins into energy) and helps the body respond to stress and aldosterone (a mineralocorticoid) which helps regulate blood pressure. 2) the <u>adrenal medulla</u> is the inner part and it produces adrenaline which helps your body respond to acute stressful situations (fight or flight) by activating the sympathetic nervous system. • The hormones of the adrenal cortex are essential for life while those of the adrenal medulla are useful, but not essential. • Minor hormones produced include both estrogen and testosterone whose quantities are greatly overshadowed by those found in the gonads.
11.*kidneys	<ul style="list-style-type: none"> • Produces renin which converts angiotensinogen (inactive) to angiotensin (active). • Produces EPO (erythropoietin) which stimulates the production of red blood cells from the bone marrow.
12.*small intestine	<ul style="list-style-type: none"> • Produces secretin which causes the release of pancreatic juices into the duodenum. • Produces CCK (cholecystokinin) which causes bile to be released from the gall bladder and also stimulates the release of pancreatic juices.
13.pancreas	<ul style="list-style-type: none"> • This 6 inch long flattened gland lies in the abdomen between the spine and the stomach. It connects to the duodenum through a duct which allows it to empty out pancreatic juices for nutrient digestion (this is its exocrine function). • The two main hormones it produces play a role in controlling glucose use in the body: <ol style="list-style-type: none"> 1) Insulin: it causes cells to take up glucose from the blood which drops blood glucose levels. 2) Glucagon: it causes cells to release glucose into the blood stream from glycogen stores in the body which causes blood glucose levels to rise. • Other hormones produced by the pancreas include:

	<ul style="list-style-type: none"> - Somatostatin: secreted when glucagon and insulin levels become too high so that glucose and salt balance can be maintained. - Vasoactive intestinal peptide (VIP): causes water and salts to be released into the intestines to control water balance - Gastrin: stimulates cells of the stomach to produce stomach acid to aid in digestion.
<p>14. ovaries</p>	<ul style="list-style-type: none"> • There are two ovaries and they are each oval-shaped and the size of a large grape. They are found in females on either side of the uterus. • They produce hormones like: <ol style="list-style-type: none"> 1) estrogens: (the three major types are estradiol, estrone and estriol) stimulates breast development and fat gain and distribution during puberty and helps develop the reproductive organs. 2) progesterone: in combination with estrogen, progesterone helps maintain healthy menstrual and ovulatory cycles. • Lesser hormones produced include: relaxin which is released prior to giving birth to relax the ligaments of the pelvis and help dilate the cervix, and inhibin which causes the pituitary to decrease production of FSH (follicle stimulating hormone). • The ovaries respond to FSH by maturing follicles (which contain eggs) and to LH (luteinizing hormone produced by the pituitary) which causes ovulation.
<p>15. testes</p>	<ul style="list-style-type: none"> • There are two testes (testicles) found in each male and they are located in the scrotum outside of the body so that they can be maintained at a lower temperature which is more optimal for sperm production. • They produce the hormone testosterone which is needed for the maturation of males during puberty – development of sex organs, lowering of voice, growth of facial and body hair, increased muscle mass, increased height and growth of Adam’s apple. • In adult males, testosterone functions to maintain libido (sex drive), sperm production, muscle strength and mass and bone density. • The testes produce testosterone in response to the release of LH (luteinizing hormone) from the pituitary.