



The endocrine system

Grade 12 - Term 2 - Week 10-11

Glands

We have two types of glands:

1. Endocrine glands - these glands secrete their products directly into the bloodstream.
2. Exocrine glands - these glands secrete their products via a duct before they reach their target organ.

Exocrine glands tend to secrete enzymes more often while endocrine glands tend to secrete more hormones.

Hormones

Hormones are very special chemical messengers that are secreted by a very important system in your body called the endocrine system.

This system and the hormones it releases controls almost all the reactions that occur in the body. Hormones control things like hunger, puberty, pregnancy, emotions, and even help our bodies to fight off a possible threat.

<https://www.youtube.com/watch?v=A0Run0HcubE>

The hypothalamus

The hypothalamus is a gland that is located at the base of the brain.

There are two sets of nerve cells in the hypothalamus that produce hormones.

One of these hormones is **ADH or antidiuretic hormone**. ADH is responsible for regulating the amount of water in the blood. The hypothalamus detects the level of water in the blood. When there is too little water in the blood more ADH is secreted which causes the kidneys to retain more water and urine becomes more concentrated.

The pituitary gland

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This gland is also located at the base of the brain, just below the hypothalamus. The pituitary gland is referred to as a 'master' gland as it controls the function of some other glands in the body.

Some hormones which are secreted by the pituitary gland are:

1. **GH** (growth hormone) - this hormone regulates growth and metabolism.
2. **TSH** (thyroid stimulating hormone) - this stimulates the thyroid gland to secrete thyroid hormones.
3. **FSH** (follicle stimulating hormone) - this acts on the ovaries and causes egg cells to become mature.
4. **LH** (Luteinising hormone) - this acts on the testes and causes the sperm cells to reach maturity and it triggers ovulation in woman.
5. **Prolactin** - this hormone stimulates milk production.

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The thyroid gland

The thyroid gland is a large butterfly shaped gland which is found at the base of the neck.

It secretes the hormone thyroxin.

Thyroxin helps to regulate metabolism and body temperature.

Pancreas

The pancreas is a relatively large gland which contains clusters of cells called the islets of langerhans.

The pancreas functions by being both an endocrine and exocrine gland.

As an endocrine gland it secretes the hormones **insulin** and **glucagon** directly into the bloodstream.

These two hormones control blood sugar levels. If the sugar levels are too high insulin is released which converts glucose into glycogen and is stored. When the sugar levels are too low glucagon is released which breaks the stored glycogen down into glucose which then enters the bloodstream.

The adrenal glands

The adrenal glands are small glands that lie above the kidneys.

They produce **adrenaline and aldosterone**.

Adrenaline is stress hormone that is produced by the adrenal glands. The secretion of this hormone causes a 'fight or flight' response to a perceived threat. It causes the heart to beat harder and faster, it also causes the bronchioles to dilate to allow more oxygen to enter the bloodstream at a quicker rate.

Aldosterone regulates the concentration of salt and water in the body. It has an effect on blood pressure.

The ovaries

The ovaries lie on each side of the uterus. They have many important functions. One of these functions is the release of hormones.

These hormones are **oestrogen and progesterone**.

Oestrogen is the primary female sex hormone. It is responsible for the development and regulation of the female reproductive system.

Progesterone is the hormone which is responsible for maintaining pregnancy.

The testis

The testis are glands which are located outside of the body and are sensitive to temperature.

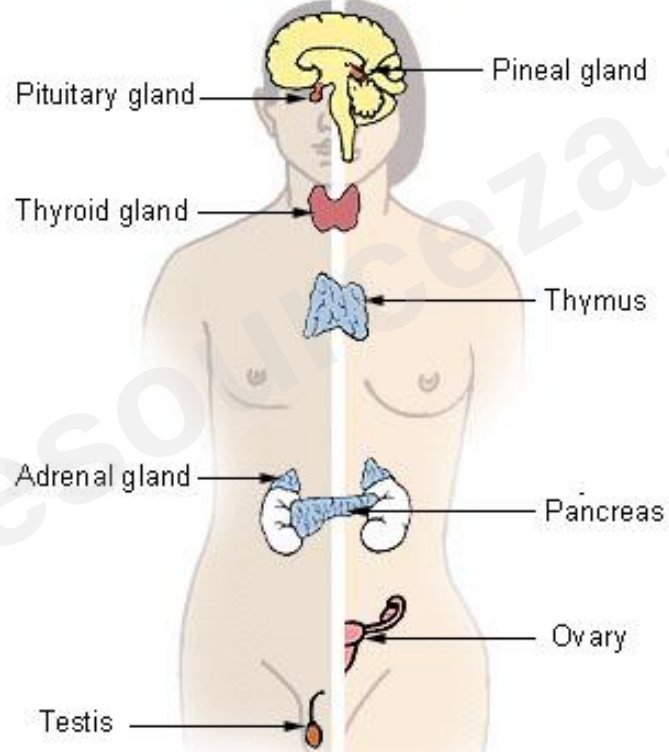
They produce the hormone **testosterone**.

Testosterone is the primary male hormone which is responsible for the development and maintenance of male sexual characteristics.

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Major Endocrine Glands

Male Female



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