

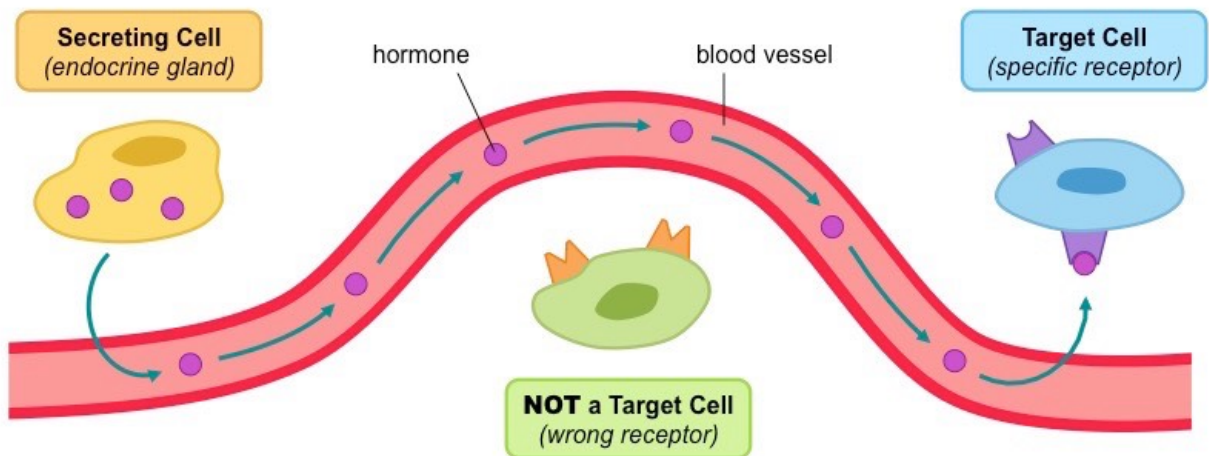
Endocrine System

The endocrine system is a system of ductless glands that release chemicals (hormones) into the blood to regulate body functions

A hormone is a chemical messenger that is transported via the bloodstream to act on distant target cells

Hormones are specific and will only activate cells or tissues that possess the appropriate target receptor

The endocrine system is slower to initiate, but has a more prolonged response when compared to the nervous system



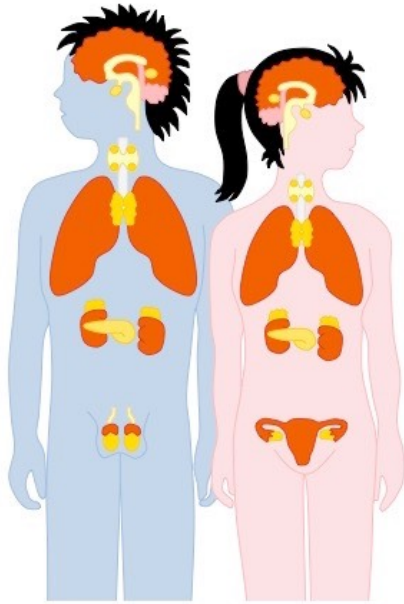
Endocrine Glands

Endocrine glands secrete their product (hormones) directly into the bloodstream, rather than through a duct (e.g. exocrine gland)

Major endocrine glands include the pancreas, adrenal gland, thyroid gland, pineal gland and the gonads (ovaries and testes)

The hypothalamus and pituitary gland are neuroendocrine glands and function to link the nervous and endocrine systems

Some organs may also secrete hormones despite not being endocrine glands (e.g. adipose tissue secretes leptin)



Gland	Hormone	Target Organ	Function
Pineal gland	melatonin	many	biological clock
Pituitary gland	FSH / LH ADH growth hormone oxytocin prolactin	ovaries kidneys many uterus breast tissue	menstrual cycle osmoregulation growth & division birth contractions milk production
Thyroid gland	thyroxin	liver	metabolic rate
Adrenal glands	adrenaline cortisol	many many	fight or flight anti-stress
Pancreas	insulin / glucagon	liver	blood sugar levels
Ovaries	estrogen / progesterone	uterus	menstrual cycle
Testes	testosterone	many	male characteristics

Hypothalamus

The hypothalamus is the section of the brain that links the nervous and endocrine systems in order to maintain homeostasis

It receives information from nerves throughout the body and other parts of the brain and initiates endocrine responses

It secretes certain neurochemicals (called releasing factors) into a portal system which stimulate or inhibit the pituitary gland

It also secretes certain hormones directly into the bloodstream via neurosecretory cells that extend into the pituitary gland

Pituitary

The pituitary gland lies adjacent to the hypothalamus and is in direct contact due to a portal blood system

The pituitary gland is often referred to as the 'master gland', as it controls the secretion of a number of other endocrine glands

The pituitary gland receives instructions from the hypothalamus and consists of two lobes (anterior and posterior lobe)

The anterior lobe (adenohypophysis) releases hormones in response to stimulation by hypothalamic releasing factors

The posterior lobe (neurohypophysis) releases hormones produced by the hypothalamus itself (via neurosecretory cells)

The Role of the Hypothalamus and Pituitary Gland in Endocrine Function

