

# Development of the Endocrine System

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The endocrine system is a set of different glands in the human body secreting hormones in response to certain stimuli. As the name suggests secretion of hormones is into the blood, in contrast to the exocrine system which consists of glands secreting their products via ducts. The word endocrine is derived from the two greek words endos = inside/within and crinis = secrete. The endocrine system is an information system which transfers information via messenger molecules (hormones). Since the transport of messengers takes place in blood, the effect of hormones is delayed and not instantly. The effect however can be sustained for up to several weeks, depending on the decay or catabolism of the hormone. Factors mediated by hormones include; growth, development, metabolism, mood, etc.

### Hypophysis or Pituitary Gland

The Hypophysis is a gland approximately 0,5 cm big, weighing half a gram. It is located on the anatomical structure of the Sella Turcica at the bottom of the Hypothalamus at the bottom of the brain. The Pituitary is connected to the Hypothalamus via the infundibular stem or pituitary stalk. The Hypophysis is divided into an anterior Pituitary or Adenohypophysis and the posterior Pituitary or Neurohypophysis. Both parts secrete hormones that are concerned with homeostatic regulations. During the fourth week of embryonal development Rathkes pouch begins to form at the top of the primitive oral cavity as a thickening of epithelial cells, which are of ectodermal origin. This epithelial mesenchymal interaction then forms an invagination the pouch of Rathke (Martin Heinrich Rathke 1793-1860 german embryologist and anatomist). At about the same time infundibulum forms as an outgrowth from neuroectoderm at the base of the diencephalon. Rathkes pouch grows dorsally towards the infundibulum and comes into close contact with it by the end of the 2nd month. By then it has also lost the connection with the stomodeum. During the next stage of development, cells in the anterior wall of Rathkes pouch proliferate rapidly, giving rise to the pars distalis of the adenohypophysis. On both sides of the pouch an outgrowth starts to appear which winds around the infundibulum and connects at its posterior side. This structure forms the pars tuberalis of the pituitary. Cells on the posterior side of Rathkes pouch proliferate only slowly forming the pars intermedia which in humans apparently serves only minor functions. The infundibulum gives rise to the stalk which is the connection to the hypothalamus and the pars nervosa forming the posterior lobe of the hypophysis. It is composed of specialized neuroglial cells, the pituicytes and axons of hypothalamic nuclei. Adeno- and Neurohypophysis together make up the pituitary gland. By the 10th week growth hormones and ACTH are detectable and by week 16 the Adenohypophysis is completely differentiated.

### Thyroid Gland

### Parathyroid Glands

### Adrenal or Suprarenal Glands

### Pancreatic Islets of Langerhans

### Links

<http://embryology.med.unsw.edu.au/Notes/endocrine7.htm>

[http://www.mc.ntu.edu.tw/department/anatomy/hsieh/Embryo/Dev\\_NS.pdf](http://www.mc.ntu.edu.tw/department/anatomy/hsieh/Embryo/Dev_NS.pdf)

<http://emedicine.medscape.com/article/845125-overview#aw2aab6b4>

<http://embryology.med.unsw.edu.au/notes/endocrine9.htm>

### Sources

see Links

LANGMANN´S Medical Embryology 12th Edition, Sadler, Thomas W., Baltimore 2012