

5.5.3

The Anterior Pituitary

As mentioned above, the anterior pituitary is composed of true glandular tissue capable of producing and secreting hormones. There are unique populations of glandular cells that secrete the various anterior pituitary hormones in response to the hypothalamic hormones, for example GnRH from the hypothalamus stimulates the secretion of FSH and LH from the anterior pituitary. This control is mediated through a special vascular arrangement between the hypothalamus and the anterior pituitary called the **hypothalamo hypophyseal portal system**. A portal system is composed of two capillary networks that are connected in series (similar to the nephron). Neurons in the hypothalamus secrete hormones (technically neurohormones since they are produced by neurons) that are taken up into the first capillary network. The blood leaving these capillaries converges on a portal vein that goes into the anterior pituitary and immediately enters the second capillary network. This system provides a direct connection between the hypothalamus and the anterior pituitary; therefore, only extremely small amounts of the hypothalamic hormones are required for control of the anterior pituitary. If the hypothalamic hormones were secreted in the general circulation, they would be greatly diluted by the 5 liters or so of blood and much larger quantities would need to be produced.

As explained earlier, the anterior pituitary produces and secretes six major hormones; Growth Hormone (GH), Prolactin (PRL), Thyroid Stimulating Hormone (TSH), Adrenocorticotrophic Hormone (ACTH), Follicle Stimulating Hormone (FSH), and Luteinizing Hormone (LH). FSH and LH will not be discussed in this unit but will be covered in the next unit on the Reproductive system. TSH and ACTH will be discussed later in conjunction with the thyroid gland and the adrenal gland.



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