

Name: Obiesie chukwudaalu chukwudi

Dept: pharmacology

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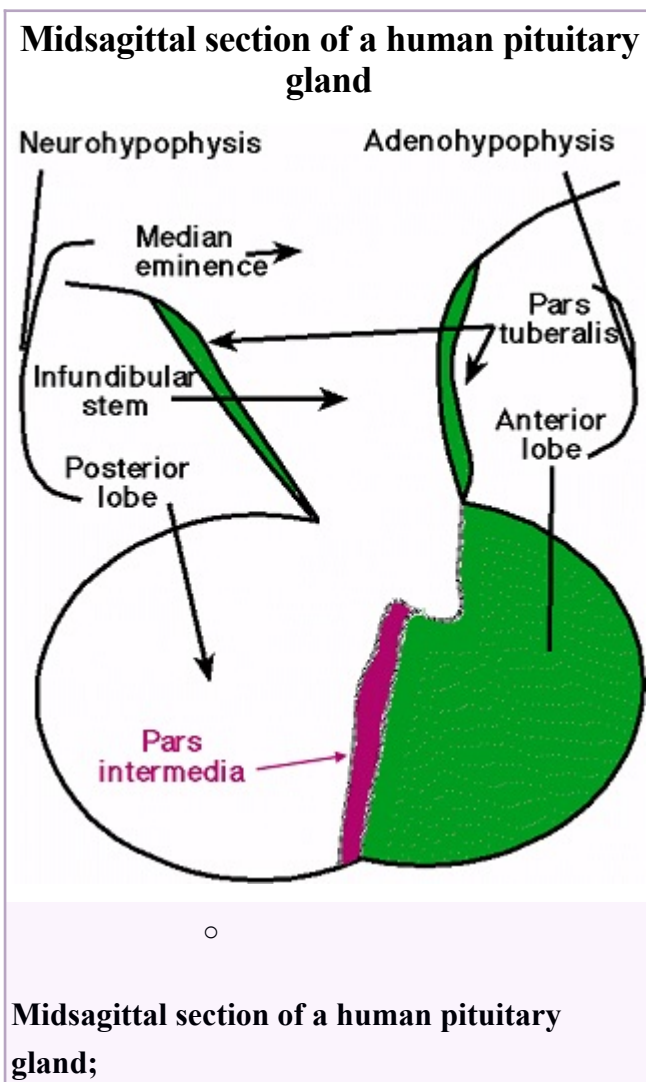
Course code: PHA304

Assignment

1. Pharmacology of the pituitary gland

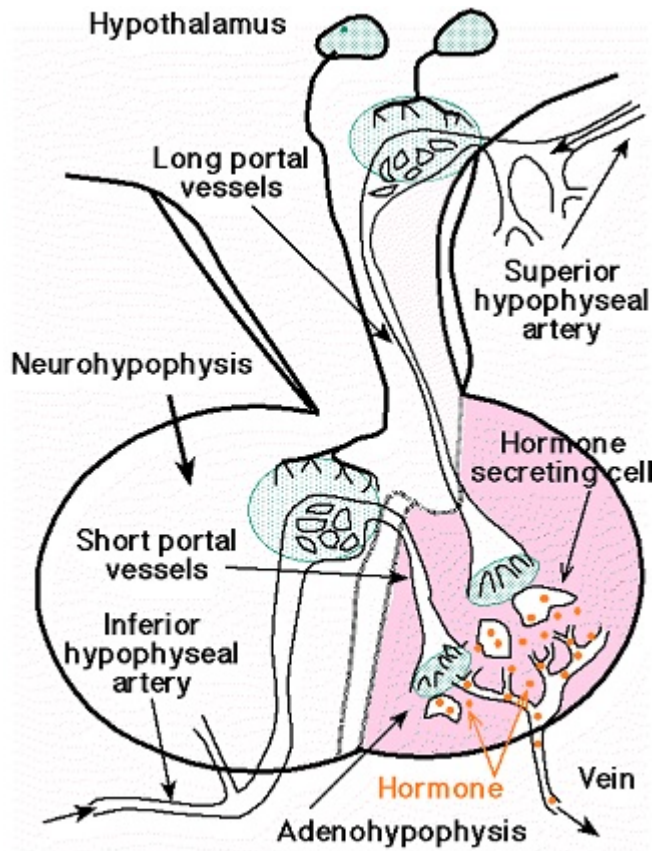
Answer

Medical Pharmacology: Pituitary Pharmacology and Physiology. "What is the Pituitary Gland?" ... The pituitary gland controls the thyroid gland, adrenocorticotrophic gland, the reproductive system, and produces growth hormones as well as prolactin. It is a very important gland for the sustainability of life.



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Sagittal section of a human pituitary, showing the relationship of its blood supply to the hypothalamic neurosecretory cells in the adenohypophysis



○

Sagittal section of a human pituitary, showing the relationship of its blood supply to the hypothalamic neurosecretory cells in the adenohypophysis.

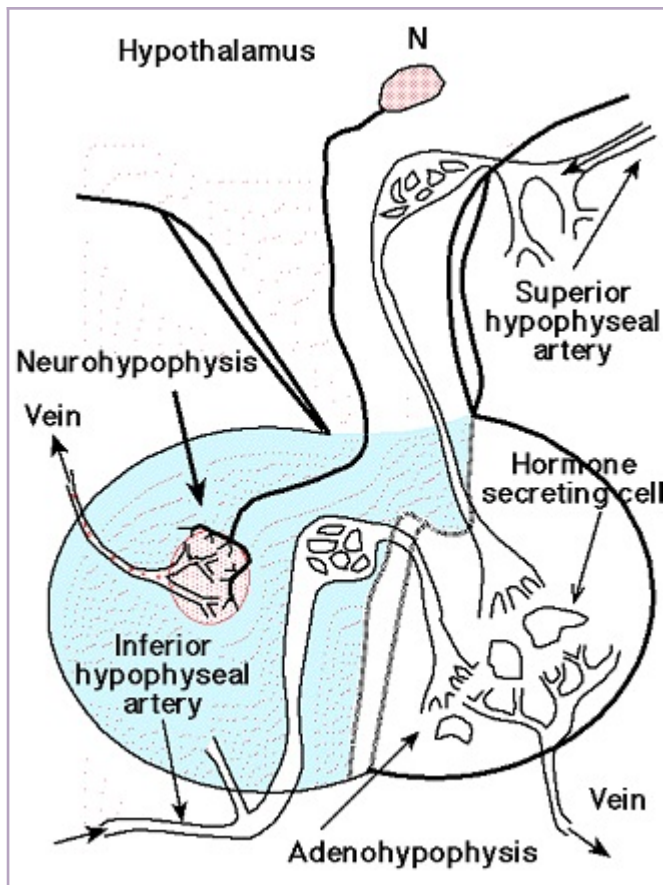
Neurosecretory neurons are shown secreting releasing factors into the capillary networks giving rise the long and short hypophyseal portal vessels, respectively.

The releasing hormones reach the hormone-secreting cells of the anterior lobe via the portal vessels.

The relationship of its blood supply to the hypothalamic neurosecretory cells in the adenohypophysis is shown and is the relationship of its blood supply to the neurosecretory cells of the supraoptic and paraventricular nuclei of the hypothalamus

○

Sagittal section of a human pituitary, showing the relationship of its blood supply to the neurosecretory cells of the supraoptic and paraventricular nuclei of the hypothalamus



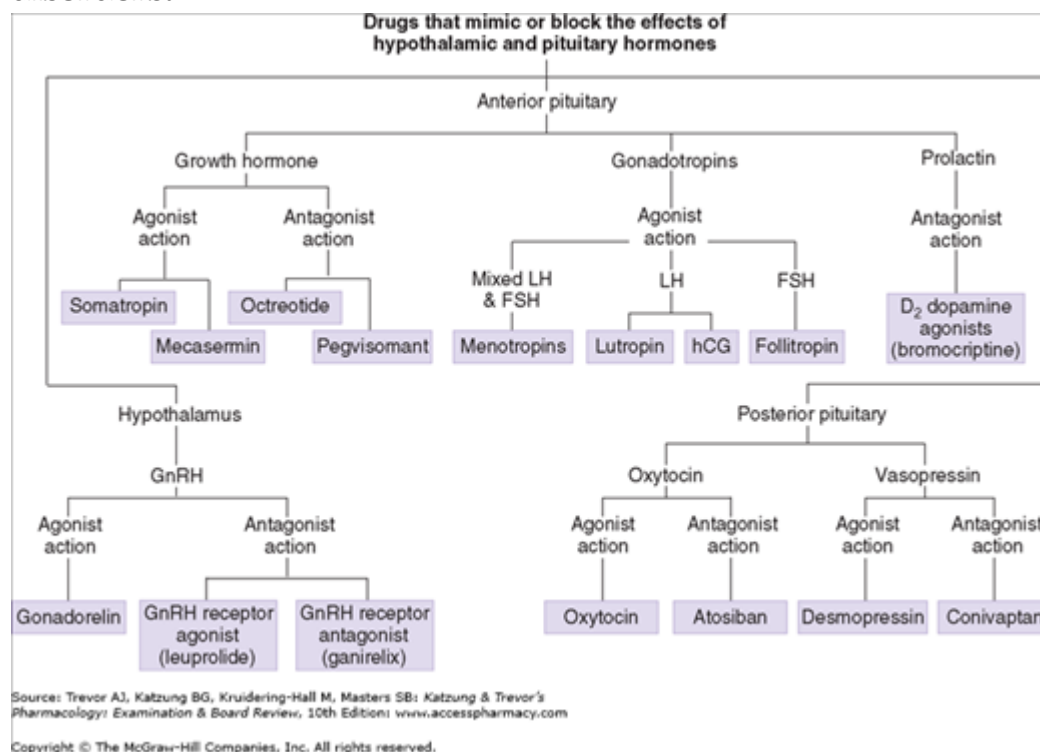
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"Sagittal section of a human pituitary, showing the relationship of its blood supply to the neurosecretory cells of the supraoptic and paraventricular nuclei of the hypothalamus. The neuron labeled N represent a neurosecretory cell releasing ADH (antidiuretic hormone) or oxytocin at its axon terminals into the capillaries giving rise to the venous drainage of the posterior lobe. "

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The hormones produced by the hypothalamus and pituitary gland are key regulators of metabolism, growth, and reproduction. Preparations of these hormones, including products made by recombinant DNA technology and drugs that mimic or block their

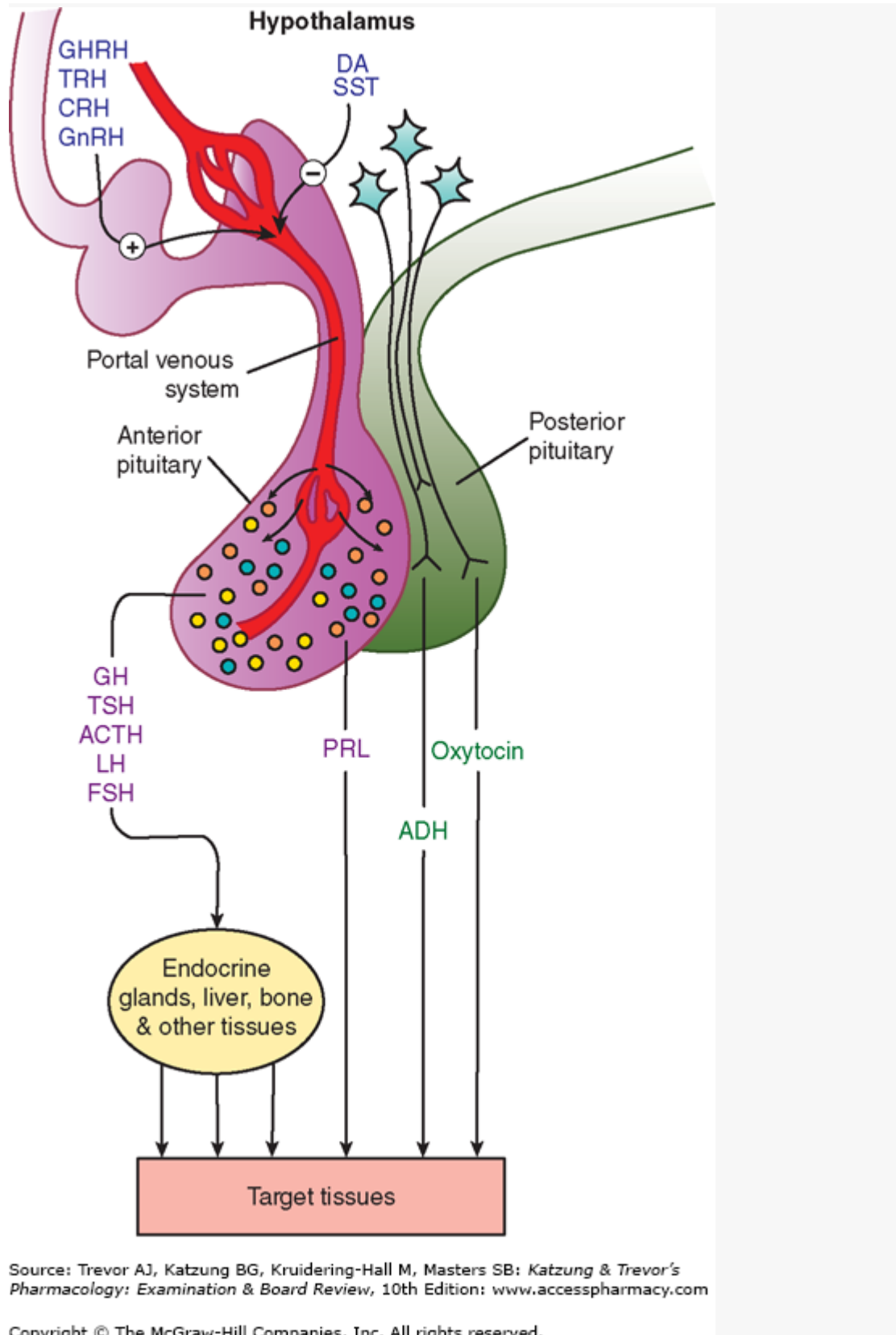
effects, are used in the treatment of a variety of endocrine disorders.



The hypothalamic and pituitary hormones and their antagonists are often grouped according to the anatomic site of release of the hormone that they mimic or block—the hypothalamus for gonadotropin-releasing hormone (GnRH); the anterior pituitary for growth hormone (GH), the 2 gonadotropins, luteinizing hormone (LH) and follicle-stimulating hormone (FSH), and prolactin; or the posterior pituitary for oxytocin and vasopressin (antidiuretic hormone [ADH]). This chapter focuses on the agents used commonly; it does not discuss the hypothalamic and pituitary hormones that are either not used clinically or are used solely for specialized diagnostic testing (thyrotropin-releasing hormone [TRH], thyroid-stimulating hormone [TSH], corticotropin-releasing hormone [CRH], adrenocorticotrophic hormone [ACTH], and growth hormone-releasing hormone [GHRH]). Hormones of the anterior pituitary are central links in the hypothalamic-pituitary endocrine system (or axis; Figure 37-1). All the anterior pituitary hormones are under the control of a hypothalamic hormone, and with the exception of prolactin, all mediate their ultimate effects by regulating the production by peripheral tissues of other hormones (Table 37-1). Four anterior pituitary hormones (TSH, LH, FSH, and ACTH) and their hypothalamic regulators are subject to feedback regulation by the hormones whose production they control.

The complex systems that regulate hormones of the anterior pituitary provide multiple avenues of pharmacologic intervention.

FIGURE 37-1



Source: Trevor AJ, Katzung BG, Kruidering-Hall M, Masters SB: *Katzung & Trevor's Pharmacology: Examination & Board Review*, 10th Edition: www.accesspharmacy.com

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The hypothalamic-pituitary endocrine system. Except for prolactin, hormones released from the anterior pituitary stimulate the production of hormones by a peripheral endocrine gland, the liver, or other tissues. Prolactin and the hormones released from the posterior pituitary (vasopressin and oxytocin) act directly on target tissues. Hypothalamic factors regulate the release of anterior pituitary hormones. ACTH, adrenocorticotropin; ADH, antidiuretic hormone [vasopressin]; CRH, corticotropin-releasing hormone; DA, dopamine; FSH, follicle-stimulating hormone; GH, growth ...