Adrenal Gland (Basic)

The adrenal glands are endocrine glands that sit on top of the kidneys and act primarily in the stress hormone pathway. They can be anatomically and functionally divided into the cortex and medulla. The cortex produces aldosterone in response to RAAS stimulation. In addition, CRF, which is made in the hypothalamus, acts on the pituitary gland to release ACTH. The adrenal cortex has ACTH receptors, which, when stimulated, lead to the release of cortisol and androgens. The medulla is responsible for the release of epinephrine and norepinephrine.

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Characteristics

Adrenal Cortex

Adrenal Cortez

The adrenal cortex runs along the outer edge of the adrenal gland and affects the stress response through production of a variety of hormones. The cortex can be broken into three layers, the zona glomerulosa, the zona fasciculata and the zona reticularis. It is here in the adrenal cortex that the renin-angiotensin-aldosterone system, or RAAS, stimulates aldosterone production.

RAAS Stimulates Aldosterone

Raspberries stimulating Aldo-stereo

The renin-angiotensin-aldosterone system, or RAAS, is a hormone system that stimulates aldosterone production.

CRF (CRH) acts on Anterior Pituitary Gland to Release ACTH

CRying-Fat kid and Air-Conditioner with Receptor

CRF, which is also known as CRH, is released from the paraventricular nucleus of the hypothalamus as a part of the body's stress response. This hormone then acts on the anterior pituitary gland, signaling it to release ACTH. This ACTH then finds its way to the adrenal cortex, where it facilitates cortisol release

Cortisol Released

Court-of-Sol

When the ACTH receptors are stimulated, cortisol is released. Cortisol is a steroid hormone that binds to the glucocorticoid receptor. It is the main hormone involved in the regulation of glucose metabolism and the stress-response mechanism.

Androgens Released

Android-genie

The zona reticularis, which is the innermost layer of the adrenal cortex, produces androgens, which are male cortical sex hormones that affect the development of male secondary sexual characteristics in males. These cortical sex hormones are also present in females. When the CRF and ACTH receptors are stimulated, androgens are released.

Adrenal Medulla

Adrenal Medusa

The adrenal medulla is located in the center of the adrenal gland and is connected to the sympathetic division of the autonomic nervous system.

Epinephrine & Norepinephrine

Epi-pen and North-epi-pen

Norepinephrine is a stress hormone that affects the amygdala, impacting attention and responses. Epinephrine is a hormone and neurotransmitter that has many functions, including regulating metabolism, heart rate, vasodilation and vasoconstriction. These catecholamines are secreted by the chromaffin cells of the adrenal medulla, affecting the "fight or flight" response of the sympathetic nervous system.