

# ADRENAL ANDROGENS

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# Androgens

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Androgens are the hormones that exert masculinizing effects.

Promote anabolism and growth.

Testosterone from the testis is the major active androgen. The adrenal androgens have less than 20% of its activity.

They are present both in males & females.

# Endocrine activity of the Adrenal Cortex

## Zona reticularis

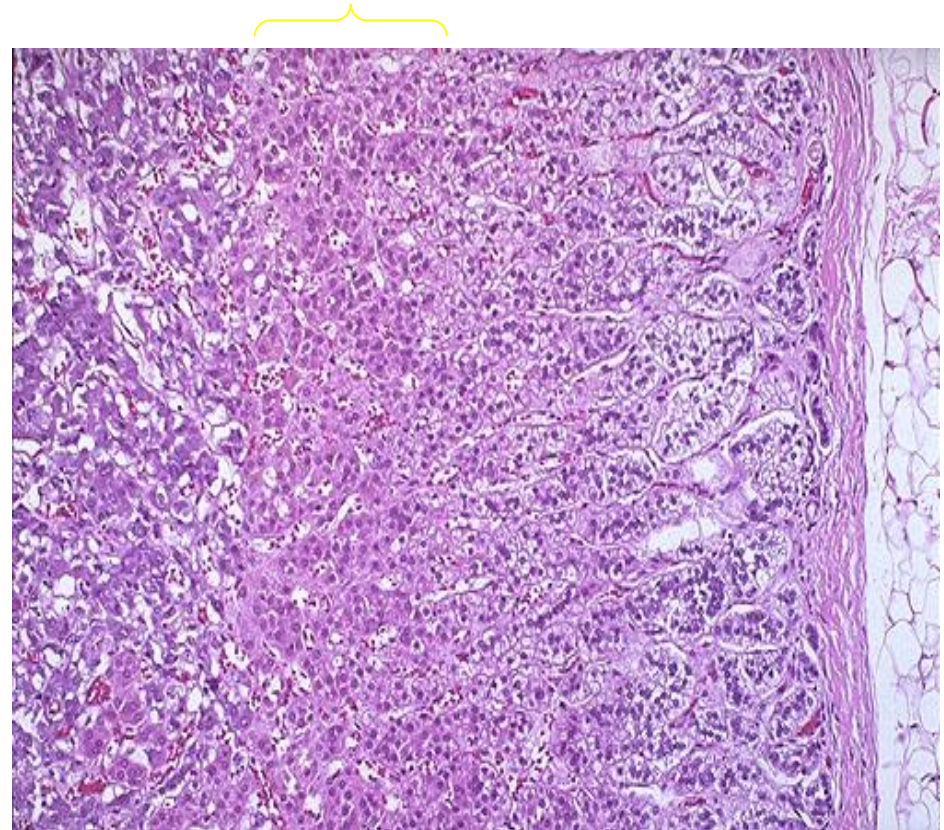
**Produces small amounts of androgens, mostly dehydroepiandrosterone (DHEA), DHEA may be converted into estrogens, androstenedione**

## Hormone Control:

**Believed to be ACTH**

## Target tissue:

**General body cells**



# Adrenal Androgens

The adrenal cortex produces both **androgens** i.e.

“male sex hormones” and **estrogens** or “female sex hormones.

The adrenal cortex in both sexes produces small amounts of sex hormone of the opposite sex. Additional small amounts of sex hormones come from nonadrenal sources.

Some testosterone in males is converted into **estrogen** by the enzyme **aromatase** found in adipose tissues.

In females, ovaries produce androgen as an intermediate step in estrogen production. Little of this androgen is released in the blood instead of being converted into estrogen.

# Adrenal androgens

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**Adrenal androgens, includes :**

- dehydroepiandrosterone (DHEA),
- androstenedione.

## Adrenal androgens, cont,....



### Dehydroepiandrosterone (DHEA):

A steroid hormone produced in the adrenal cortex from cholesterol. It is the primary precursor of natural estrogens.

It is the most abundant adrenal androgen

## Adrenal androgens, cont,....

- Androstenedione:
- An androgenic steroid produced by the **testes, adrenal cortex,** and **ovaries**.
- Androstenediones are converted metabolically to testosterone and to estrogens in the fat and other peripheral tissues. It is an important source of estrogen in men and postmenopausal women.
- Androstenedione were used as an athletic or body building supplement.

# Effects of adrenal androgens:

Control androgen-dependent processes in the female as:

- 1- growth of pubic and axillary hair,
- 2- pubertal growth spurt,
- 3- development and maintenance of female sexual drive.



# Congenital adrenal hyperplasia

## (Adrenogenital Syndrome)

### Causes:

Inherited as autosomal recessive diseases and can affect both boys and girls.

The defect is lack of an enzyme (21-hydroxylase) needed by the adrenal gland to make the major steroid hormones of the adrenal cortex: cortisol and aldosterone. Due to the block in synthesis of these hormones, there is abnormal 'feedback' and steroids are 'diverted' to becoming androgens, a form of male sex hormones.

## Adrenogenital Syndrome

In **pre-pubertal males** it causes the rapid develop of secondary sexual characters



## Adrenogenital Syndrome

**in females** causes beard growth, deeper voice, masculine distribution of body hair, and growth of the clitoris to resemble a penis.

**Picture:**

**Virilizing adrenal hyperplasia in a newborn female baby, DHEA was converted to testosterone**

