

# Gonadocorticoids

[in hypothalamus]

- (Paraventricular nucleus CRH, ACTH, G – coupled receptors, G stimulatory protein, GDP) OFF, GTP On, ADENYLATE CYCLASE ACTIVATES ATP CAMP ACTIVATES PROTEIN KINASE A (P.K.A)

on Zona reticularis

secrete stimulate from Anterior Pituitary Gland binds

- P.K.A phosphorylate different enzymes

## • Steroid hormones

formed of

Cholesterol

Pregnenolone

Progesterone and ((17-OH pregnenolone))

the first sex hormone that is synthesized from 17-OH PREG

((17-OH PREG))

DHEA (dehydroepiandrosterone) and 17-OH progesterone

Progesterone, 17-OH progesterone, Androstenedione

DHEA to Androstenedione (Gonad corticoids)

Very weak sex hormones

# DHEA and Androstenedione

in Male ( testes) converted into testosterone ( minimum) *so, it's a weak hormone.*

Female estrogen ( minimum)

Secondary sex characteristics ① *\* Their effects are*

Hair growth

Facial ( male)

Axillary

Pubic

Sebaceous secretion ②

Libido ( sex drive) ③

Mamillary gland ( female) ④

Clitoris ( female) ⑤

## androgens *(causes)*

*DHEA*  
*Androstenedione.*

*the effect of this syndrome*

Adrenal genital masculinization (high level of DHEA and Androstenedione)

Increase libido in male and fascial hair in female

- Very weak ✓
- Acts as precursors ✓

( Male testosterone )

( Female estrogen )

Secondary sex characteristics

*\* will be in the ...*

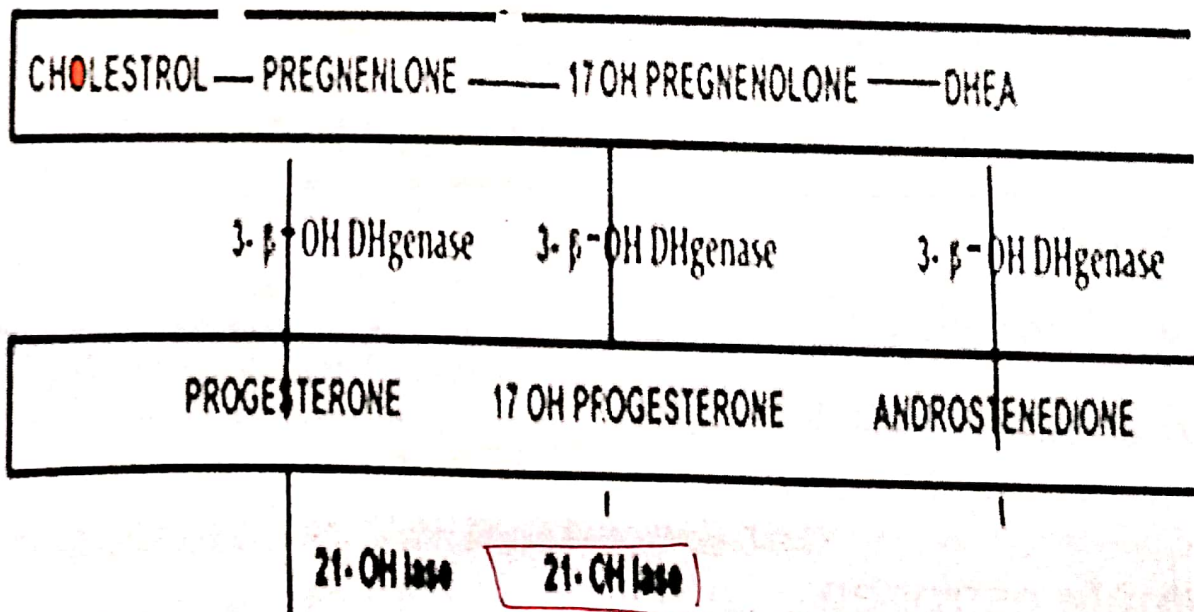
\*important for conversion (progesterone) into deoxycorticosterone.  
 \* conversion of P (17OH progesterone) into 11-deoxycorticoid.

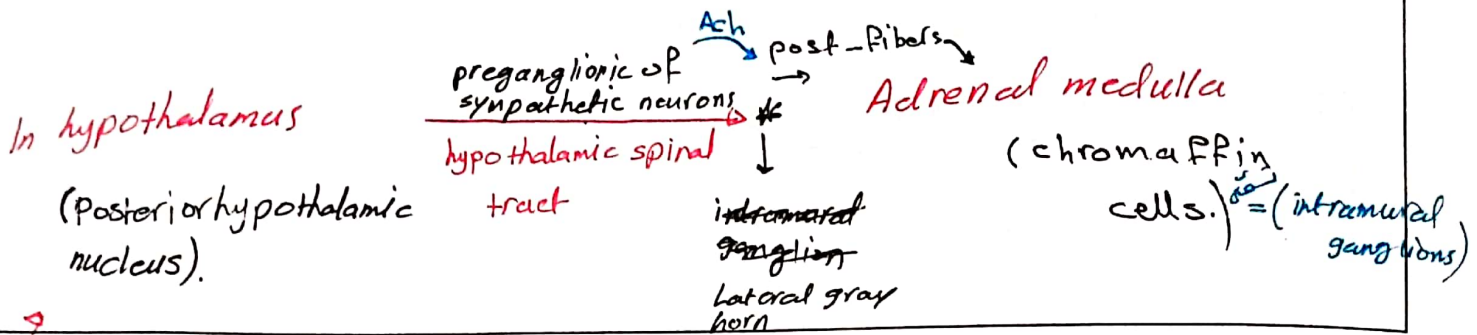
# Deficiency of 21 hydroxylase

causes:  $\rightarrow$

- Adrenogenital syndrome (95%)  $\rightarrow$  نفيبه لبيبه 7.95 في 95%  $\rightarrow$  الوراثة
- Excess of adrenal androgens  $\rightarrow$  among of them: masculinization.
- Deficiency cortisol and aldosterone
- Ambiguous genitals and hypospadias  $\rightarrow$  birth defect in which the opening of the urethra isn't at the tip of the penis.
- Partial or complete  $\rightarrow$  the Genitalia isn't clear
- Partial with or without aldosterone deficiency more common
- Precocious puberty in male children

\* due to deficiency of 21-hydroxylase  $\rightarrow$  Accumulation of 17-OH progesterone  
 $\rightarrow$  converts to 17-OH pregnenolone  $\rightarrow$  excess of adrenal androgen.





## Mechanism of secretion Adrenal Medulla

- Chromaffin cells : inside the medulla  
 ((cell bodies)) of postganglionic motor neurons  
of sympathetic nervous system

Thoracolumbar output (T1-L2) ( intramural ganglion)

short time stress ( acute stress)

Fight or flight (sympathetic)

Hypothalamus (hypothalamic spinal tract)

- Posterior hypothalamic nucleus to <sup>in hypothalamus.</sup>  
Preganglionic of sympathetic neurons ( cell  
bodies in the lateral gray horn of spinal cord)

Preganglionic long and Moving through chain ganglion ( Exception for sympathetic)

Ach, nicotinic receptors *on adrenal medulla*

tyrosine, *synthesis*  
L- DOPA, *convert to*  
DOPAMINE, *convert to*

20% Norepinephrine, 80% Epinephrine ( Phenol ethanalamine and methyl transferase)

*↓ enzymes help in converting dopamine to Epi, NE*

## epinephrine *⇒ effect of*

Liver

EPI to G protein, ..... P.K.A increasing the sensitivity *of the receptors.*  
cortisol (1)

Glycogenolysis *(indirect)*

Gluconeogenesis (hyperglycemia) *odd chain F.A,*  
glycerol, A.A, Lactic Acid

Adipocyte (2)

Lipolysis G protein, hormone sensitive lipase,  
glycerol ( Liver), fatty acids ( beta  
oxidation in muscle, a lot of ATP)

*which causes*

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*enzymes help in converting dopamine to Epi, NE*

epinephrine  $\Rightarrow$  *effect of*

Liver

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## HEART

- ⊕ Increase blood pressure (how?)
- \* Beta adrenergic receptors on SA node
  - ①\* Increase heart rate
  - ②\* Increase contractility
- \* Alpha adrenergic receptors (Binds to NE)
  - ⊕ Vasoconstriction

## Lung

- ⊕ Resp rate
- ⊕ dilate bronchioles <sup>by</sup> Beta 2 adrenergic receptors
- Constrict blood vessels of GIT, kidneys, skin

Pheochromocytoma ← Cancer of Adrenal Medulla

- Cancer of adrenal medulla
- Excessive amount of epinephrine and norepinephrine