QUESTION 1

Steroids are **synthesized in the gonads (ovaries and testes) and adrenal cortex** from **cholesterol**

A. through progesterone as an intermediate

B. through Δ^5-pregnenolone as an intermediate

C. Through cortisol as an intermediate

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QUESTION 2

Conversion of steroid hormones to **less active or inactive forms involves alteration of ring substituents** rather than the ring structure itself.

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Cholesterol the precursor for adrenal steroidogenesis is

A. **Obtained from circulation**
B. **Generated de novo within the adrenal cortex from acetyl coenzyme A (CoA).**
C. **The adrenal can utilize high-density lipoprotein (HDL) cholesterol**
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QUESTION 5

The endoplasmic reticulum hydroxylases involved in steroid hormone synthesis

A. use molecular oxygen (O_2) to introduce one oxygen atom into the steroidal substrate (as an OH), while the second atom is reduced to water.

B. move the double bond from the B ring to the A ring to produce progesterone

C. detach an H from its molecule steroid. NAD is converted to NADH.

D. None of the above

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QUESTION 6

Conversion of pregnenolone to aldosterone in the adrenal zona glomerulosa cells **requires**

A. **the endoplasmic reticulum 21-hydroxylase**
B. **11 β-hydroxylase located in mitochondria**
C. **18-hydroxylase located in mitochondria**
D. **All of the above**

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To form cortisol, primarily in adrenal zona fasciculata cells is/are required,

A. **7-hydroxylase in the endoplasmic reticulum**
B. **21-hydroxylase in the endoplasmic reticulum**
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To form cortisol, primarily in adrenal zona fasciculata cells is/are required,

A. 17-hydroxylase in the endoplasmic reticulum
B. 21-hydroxylase in the endoplasmic reticulum
C. 11-hydroxylase located in mitochondria
D. All of the above

QUESTION 8

……. is the key enzyme for estrogen production in the ovary

A. 7-hydroxylase
B. 21-hydroxylase in the endoplasmic reticulum
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QUESTION 9

Which of the following statements is correct about steroid metabolism

A. **Rapid metabolism**
B. **Age does not influence hepatic steroid metabolism**
C. **Slow metabolism**
D. **Estimates of steroid hormone secretion are not based on urinary metabolite levels.**

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Reduction of testosterone το dihydrotestosterone a more potent androgen happens by

A. **21-hydroxylase**
B. **5a –reductase**
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D. **3β-hydroxysteroid dehydrogenase type II**

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QUESTION 11

What is correct from the following statements about StAR protein

A. **is specifically expressed in the liver**
B. **Patients with lipoid congenital adrenal hyperplasia express functional StAR proteins**
C. **facilitates translocation of cholesterol from the outer to the inner mitochondrial membranes**
D. **It is a glucoprotein**

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QUESTION 12

7-dehydrocholesterol is activated in the skin by sunlight to generate

A. cortisol

B. aldosterone

C. cholesterol

D. vitamin D3

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What is correct about cortisol

A. **Most of the circulating cortisol (75%- 80%) binds to a specific corticosteroid binding a2-globulin (CBG) known as transcortin.**
B. **About 95% of plasma cortisol is bound to albumin with a much lower affinity.**
C. **The concentration of transcortin decreases during pregnancy and after estrogen administration.**
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QUESTION 14

What is correct about testosterone

A. **65% of circulating testosterone is bound to a liver-derived glycoprotein called sex hormone-binding globulin (SHBG).**
B. **1 %- 2% is in the free form and the rest is bound to albumin and other proteins.**
C. **Estradiol bound to SHBG dissociates very rapidly, and it is taken up by target tissues.**
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QUESTION 15

Steroid receptors under basal conditions

A. **exist as cytoplasmic, multimeric complexes that include hormone response elements**

B. **exist in the nucleus**

C. **exist as cytoplasmic, multimeric complexes that include the heat shock proteins (HSPs) and immunophilins of the FK506 family**

D. **None of the above**

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QUESTION 16

Type 1 nuclear receptors

A. **In the absence of ligand, the receptors are held in the cytoplasm in an inactive state by heat shock proteins**

B. **Ligand-binding inhibits the conformational change that causes the release of the heat shock proteins, nuclear translocation, and dimerization and association with chromatin at specific sequences of DNA termed hormone response elements (HREs)**

C. **In the presence of ligand, the receptors are held in the cytoplasm in an inactive state by heat shock proteins**

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B. Ligand-binding inhibits the conformational change that causes the release of the heat shock proteins, nuclear translocation, and dimerization and association with chromatin at specific sequences of DNA termed hormone response elements (HREs)

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QUESTION 17

All of the following are normal events leading to secretion of aldosterone from the adrenal gland except

A. renin is released by the kidney in hypovolemia

B. angiotensinogen binds to membrane receptors

C. Ca^{2+} levels in the cell rise

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Angiotensinogen is cleaved by renin to angiotensin I, which must further be cleaved by converting enzyme to active angiotensin II

QUESTION 18

Which of the following hormones belongs to the C19 steroid group?

A) Progesterone

B) 17/β-estradiol

C) Testosterone

D) Cortisol

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In the general reaction catalyzed by cytochrome P450, what serves as a two-electron donor?

A) Oxygen (O2)

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Which enzyme(s) is/are responsible for converting Δ5-pregnenolone to progesterone in the synthesis of steroid hormones?

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B) Isocaproaldehyde

C) Δ 4,5-isomerase

D) 3β-Dehydrogenase and Δ ^{4,5}-isomerase

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Which of the following statements about steroid metabolism is correct?

A) Aldosterone has a longer plasma half-life than cortisol due to extensive binding to plasma proteins.

B) Enzymatic reactions involved in steroid metabolism increase biological activity and decrease solubility in water.

C) Conjugation of steroids with glucuronides and sulfates decreases water solubility, hindering their excretion in urine.

D) The clearance of some steroids is slower in patients with hyperthyroidism.

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Which hormone is indispensable for ovulation, nidation of the fertilized egg, and the maintenance of pregnancy, and also inhibits the secretion of GnRH?

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How are type I nuclear receptors activated and what is their typical response element in DNA called?

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B) Activated by ligand-binding, and they bind to nuclear translocation elements

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What is the physiological significance of down-regulation of hormone receptors by their own ligands?

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B) It decreases the half-life of the receptor protein

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D) Initiation at the plasma membrane, either by membrane-localized nuclear receptors or distinct membrane receptors.

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