Western

UNIVERSITY · CANADA

Tutorial 13
Sections 009/010

TA: Greydon Gilmore

Physiology 2130

Jan 14th, 2020

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Your TA reminding you…

- **3rd Peerwise assignment** (1.5%)
  - Post 2 MC questions: due Feb 12th @ midnight
  - Answer 5 MC questions: due Feb 14th @ midnight
- **3rd Quiz** (1%)
  - Opens: Feb 24th @ 4pm
  - Closes: Feb 25th @ 4pm
- **3rd Midterm** (15%)
  - When: Feb 28th @ 6pm-7pm

Today

- Group work activity
- Learning Catalytics Question
- Midterm 2 review

Group Work

Model a nephron!

Using the play doh, model a nephron. Placing your model on a piece of paper, indicate with labels around the model the following structures and take a picture:

- Renal corpuscle
- Proximal tubule
- Descending limb of the loop of Henle
- Ascending limb of the loop of Henle
- Distal convoluted tubule
- Collecting duct
- Juxtaglomerular apparatus

Learning Catalytic Question

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Midterm 2 review

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1. What statement about the pancreas is NOT correct?

A. alpha cells secrete a hormone in response to hypoglycemia
B. an Islet of Langerhans is considered endocrine tissue
C. the precursor to make hormones released by alpha and beta cells is cholesterol
D. insulin released from the pancreas stimulates cells to take up glucose

1. What statement about the pancreas is NOT correct?

A. alpha cells secrete a hormone in response to hypoglycemia
   - releases glucagon

B. an Islet of Langerhans is considered endocrine tissue

C. the precursor to make hormones released by alpha and beta cells is cholesterol
   - precursor for peptides -> amino acids

D. insulin released from the pancreas stimulates cells to take up glucose
   - in response to hyperglycemia

3. What is true about the adrenal cortex?

A. the hormones released by the adrenal cortex bind to intracellular receptors
B. adrenocorticotropic hormone stimulates all the layers of the adrenal cortex to produce their hormones
C. mineralocorticoids are made by the zona fasciculata
D. the adrenal cortex makes 5 different classes of hormones

3. What is true about the adrenal cortex?

A. the hormones released by the adrenal cortex bind to intracellular receptors
   - steroids

B. adrenocorticotropic hormone stimulates all the layers of the adrenal cortex to produce their hormones
   - zona fasciculata

C. mineralocorticoids are made by the zona fasciculata
   - zona glomerulosa

D. the adrenal cortex makes 5 different classes of hormones
   - three classes: mineralocorticoids, glucocorticoids and androgens

5. Sensory afferent fibers for the autonomic nervous system (ANS) send signals to which of the following?

A. to target organs like smooth muscle and glands
B. to autonomic ganglia of the SNS and PSNS
C. to the hypothalamus control center
D. to the central nervous system integration centers

5. Sensory afferent fibers for the autonomic nervous system (ANS) send signals to which of the following?

A. to target organs like smooth muscle and glands
   - not target centered

B. to autonomic ganglia of the SNS and PSNS
   - only outward signals

C. to the hypothalamus control center
   - first sent to integration centre then activates hypothalamus

D. to the central nervous system integration centers

9. Which of the following events does NOT take place at the neuromuscular junction?

A. Ca++ flowing into the end plate region of the cell causes the release of neurotransmitter from the axon terminal

B. Na+ flowing into the muscle cell through chemically gated channels produces the end plate potential (EPP)

C. once the action potential is generated it propagates out along the sarcolemma and down the transverse (T) tubules

D. after being released, acetylcholine is broken down by the enzyme acetylcholinesterase and recycled back into the axon terminal

9. Which of the following events does NOT take place at the neuromuscular junction?

A. Ca++ flowing into the end plate region of the cell causes the release of neurotransmitter from the axon terminal
   - flows into the synaptic terminal not the motor end plate

B. Na^+ flowing into the muscle cell through chemically gated channels produces the end plate potential (EPP)

C. once the action potential is generated it propagates out along the sarcolemma and down the transverse (T) tubules

D. after being released, acetylcholine is broken down by the enzyme acetylcholinesterase and recycled back into the axon terminal

11. Some pesticides are quite poisonous because they contain a type of chemical that breaks down and destroys acetylcholinesterase. If a person was exposed to such a chemical, what would you expect to see occur at the neuromuscular junction?

A. there would be a constant release of acetylcholine from the axon terminal in response to one action potential
B. a very long-lasting EPP that is maintained for a long period of time in response to one action potential
C. there would be no release of neurotransmitter from the axon terminal in response to an action potential on the motor neuron
D. no action potentials on the muscle cell in response to an action potential on the motor neuron

11. Some pesticides are quite poisonous because they contain a type of chemical that breaks down and destroys acetylcholinesterase. If a person was exposed to such a chemical, what would you expect to see occur at the neuromuscular junction?

A. there would be a constant release of acetylcholine from the axon terminal in response to one action potential

B. a very long-lasting EPP that is maintained for a long period of time in response to one action potential
   - ACh would not be broken down and would continue binding

C. there would be no release of neurotransmitter from the axon terminal in response to an action potential on the motor neuron

D. no action potentials on the muscle cell in response to an action potential on the motor neuron

13. Which of the following is correct?

A. the atrioventricular (AV) valves prevent the blood from flowing back into the aorta when the ventricles contract
B. the pulmonary valve prevents blood from flowing back into the right ventricle when it relaxes
C. the sinoatrial (SA) node is located in the left atrium
D. the atrioventricular ring prevents blood from flowing back into the atria when the ventricles contract

13. Which of the following is correct?

A. the atrioventricular (AV) valves prevent the blood from flowing back into the aorta when the ventricles contract
   - aortic semilunar valves

B. the pulmonary valve prevents blood from flowing back into the right ventricle when it relaxes

C. the sinoatrial (SA) node is located in the left atrium
   - right atrium

D. the atrioventricular ring prevents blood from flowing back into the atria when the ventricles contract
   - the valves prevent backflow of blood

29. According to the myogenic theory of blood flow regulation, which of the following will occur?

A. an increase in blood pressure will activate the ANS to cause vasoconstriction of the smooth muscle

B. an increase in blood pressure will initially dilate the blood vessels which will then vasoconstrict to return blood flow to normal

C. an increase in blood flow will be caused by the release of metabolites which will vasodilate the blood vessel to increase blood flow

D. an increase in pressure will be caused by the release of angiotensin II which causes blood vessels to constrict

29. According to the myogenic theory of blood flow regulation, which of the following will occur?

A. an increase in blood pressure will activate the ANS to cause vasoconstriction of the smooth muscle
   - ANS not mentioned in myogenic theory

B. an increase in blood pressure will initially dilate the blood vessels which will then vasoconstrict to return blood flow to normal

C. an increase in blood flow will be caused by the release of metabolites which will vasodilate the blood vessel to increase blood flow
   - metabolic theory

D. an increase in pressure will be caused by the release of angiotensin II which causes blood vessels to constrict
   - humoral mechansism

33. Which of the following events occur(s) during excitation contraction coupling?

1) voltage sensors detect the EPP and open Ca++ release channels
2) Ca++ diffuses out of the lateral sac of the SR
3) Ca++ binds to tropomyosin which then rolls off the myosin binding sites found on actin
4) Ca++ is pumped back into the SR by active transport causing the muscle to relax

A) if only 1,2 and 3 are correct
B) if only 1 and 3 are correct
C) if only 2 and 4 are correct
D) if only 4 is correct
E) if ALL are correct

33. Which of the following events occur(s) during excitation contraction coupling?

1) voltage sensors detect the EPP and open Ca++ release channels
   - detect an AP!
2) Ca++ diffuses out of the lateral sac of the SR
3) Ca++ binds to tropomyosin which then rolls off the myosin binding sites found on actin
   - binds to troponin
4) Ca++ is pumped back into the SR by active transport causing the muscle to relax

A) if only 1,2 and 3 are correct
B) if only 1 and 3 are correct
C) if only 2 and 4 are correct
D) if only 4 is correct
E) if ALL are correct

34. Which of the following will cause a decrease in blood flow through a blood vessel?

1) epinephrine binding to beta receptors on the blood vessel
2) SNS stimulation of the blood vessel
3) a buildup of carbon dioxide around the blood vessel
4) the presence of angiotensin II in the blood vessel

A) if only 1,2 and 3 are correct
B) if only 1 and 3 are correct
C) if only 2 and 4 are correct
D) if only 4 is correct
E) if ALL are correct

34. Which of the following will cause a decrease in blood flow through a blood vessel?

1) epinephrine binding to beta receptors on the blood vessel
   - attachment to alpha receptors, beta would lead to dilation
2) SNS stimulation of the blood vessel
   - causes contraction of smooth muscles (vasoconstriction)
3) a buildup of carbon dioxide around the blood vessel
   - a drop in CO^2 would cause vasoconstriction
4) the presence of angiotensin II in the blood vessel
   - most potent vasoconstrictor

A) if only 1,2 and 3 are correct

B) if only 1 and 3 are correct

C) if only 2 and 4 are correct

D) if only 4 is correct

E) if ALL are correct

35. Which of the following about end diastolic volume (EDV) is/are correct?

1) if EDV increases, stroke volume will increase
2) if venous return increases, EDV will increase
3) if EDV increases, cardiac output will increase
4) breathing deeply can increase EDV

A) if only 1,2 and 3 are correct
B) if only 1 and 3 are correct
C) if only 2 and 4 are correct
D) if only 4 is correct
E) if ALL are correct

35. Which of the following about end diastolic volume (EDV) is/are correct?

1) if EDV increases, stroke volume will increase
   - heart is filling with more blood
2) if venous return increases, EDV will increase
   - Frank-Starling Law!
3) if EDV increases, cardiac output will increase
   - with increase in stroke volume you will have increase in CO
4) breathing deeply can increase EDV
   - respiratory pump

A) if only 1,2 and 3 are correct

B) if only 1 and 3 are correct

C) if only 2 and 4 are correct

D) if only 4 is correct

E) if ALL are correct

Next Tutorial (Jan 21st)

- Renal physiology!

What Questions Do You Have?

You can ask in the **Owl forums** as well!

Also anonymously ask questions in the **online dropbox**!!

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