

CNS-Biochem

Archive

Lecture 1

Brain Energy Metabolism I

Medical card

Name _____

Date of b _____

Gender _____

Address _____

Date of call _____

Sign _____

1. One of the following is NOT correct:

- A. The uncoupling between O₂ and glucose in brain tissue indicates that not all glucose taken up will be consumed in aerobic respiration for energy generation.
- B. Circulating lactate can be used as energy substrate in brain.
- C. Neuronal cells can form lactate from pyruvate in reversible reaction catalyzed by lactate dehydrogenase.
- D. Astrocytes store small amount of glucose as glycogen.
- E. GLuT 1 55 KDa isoform is localized on endothelial cells of BBB.

Answer: C. Neuronal cells can form lactate from pyruvate in reversible reaction catalyzed by lactate dehydrogenase.

2. The most energy consuming process in the brain is:

- A. Restoring ionic gradient across the plasma membrane after excitation.
- B. Passive transport through Na⁺/K⁺ ATPase pump.
- C. Glycolysis.
- D. TCA
- E. Glycogen storage.

Answer: A. Restoring ionic gradient across the plasma membrane after excitation.

3. The RQ of the brain is ___ which strongly confirms that _____. Choose the best:

- A. 0.5, The main substrate of the brain is lactate.
- B. 0.5, The main substrate of the brain is glucose.
- C. 1, The main substrate of the brain is lactate.
- D. 1, The main substrate of the brain is glucose.
- E. 1.5, The main substrate of the brain is lactate.

Answer: D. 1, The main substrate of the brain is glucose.

4. More than 70% of ATP molecules generated in brain tissues are consumed in:

- A. Synthesis of neurotransmitters from glucose.
- B. The conversion of pyruvate to lactate.
- C. The restoration of ionic gradients which are dissipated due to induction and excitation particularly by Na⁺/ Ca²⁺ ATPase pump.
- D. Pumping ions actively against their concentration gradients by Na⁺/K⁺ ATPase pump.
- E. The reuptake of glutamate by astrocytes.

Answer: D. Pumping ions actively against their concentration gradients by Na⁺/K⁺ ATPase pump.

5. The brain depends only on ketone bodies for energy production in:

- A. Bottle- fed neonates.
- B. Non- ketogenic conditions.
- C. Starvation and DM1.
- D. Aerobic conditions.
- E. Fermentation.

Answer: C. Starvation and DM1.

6. All of the following are true about the fate of excess 4.4 mmol of glucose, EXCEPT:

- A. Component of BBB.
- B. Utilized in the synthesis of brain neurotransmitters.
- C. Formation of glycolipids and glycoproteins in neural cells.
- D. Formation of glycogen in astrocytes.
- E. Formation of lactate.

Answer: A. Component of BBB.

7. All of the following are true about the fate of excess 4.4 mmol of glucose, EXCEPT:

- A. Synthesis of glycogen in neurons.
- B. Utilized in the synthesis of glutamate.
- C. Utilized in the synthesis of GABA.
- D. Utilized in the synthesis of Ach.
- E. Anaerobic fermentation.

Answer: A. Synthesis of glycogen in neurons.

8. In breastfed neonates, the primary and main source of energy in numerous amounts is/ are:

- A. Glucose only.
- B. Ketone bodies.
- C. Glucose, acetoacetate and beta hydroxybutyrate.
- D. Mannose.
- E. Lactate.

Answer: C. Glucose, acetoacetate and beta hydrobutyrate

9. The brain consumption of glucose is a ____ of the total body glucose. The correct answer is:

- A. Half.
- B. One fifth.
- C. Two thirds.
- D. One fourth.
- E. One Third.

Answer: D. One fourth .

الأسئلة التالية هي أرشيف سابق وهي لا تتعلق بشكل مباشر مع المحاضرات السنة الحالية

1. One of the following cells is responsible for postnatal development of BBB:

- A. Neurons.
- B. Astrocytes.
- C. Pericytes.
- D. Microglia.
- E. Astrocytes and pericytes.

Answer: E. Astrocytes and pericytes.



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Lecture 2

Brain Energy Metabolism
II

Medical card

Name _____

Date of b _____

Gender _____

Address _____

Date of call _____

Sign _____

CNS-Biochemistry **Lecture 2**

1. One of the following is not correct ?

- a. the uncoupling between O₂ and glucose in brain tissue indicates that not all glucose taken up will be consumed in aerobic respiration for energy generation
- b. circulating lactate can be used as energy substrates in brain
- c. neuronal cells can form lactate from pyruvate in reversible reaction catalysed by lactate dehydrogenase
- d. Astrocytes store small amount of glucose as glycogen
- e. GLuT 1 55KDa isoform is localized on endothelial cells of blood brain barrier

ليش C؟ لانها وظيفة الAstrocyts مش الneural cells و الastrocytes تعتبر nonneural

Answer : C

2. What is most energy consuming process in the brain ?

Select one:

- a. Restoring ionic gradient across the plasma membrane after excitation
- b. Passive transport of Na⁺/K⁺ pump

Answer : B

3. The RQ of the brain is ___, which strongly confirms that ___?

Select one:

- a. 1, the main substrate of the brain is lactate
- b. 1, the main substrate of the brain is glucose

Answer : B

4. What cell is responsible for postnatal development of BBB ?

- a. neurons
- b. Astrocytes

Answer : B

5. The junction between two communicating neurons is ?

- a. Synapse
- b. Neuromuscular junction
- c. Dendrite
- d. Axon
- e. Receptor

Answer : A

CNS-Biochemistry **Lecture 2**

6. How does the neurotransmitter produce a signal in the postsynaptic cell ?

- a. Binding to post-synaptic receptor
- b. Binding to pre-synaptic receptor
- c. Binding to auto-receptor

Answer : A

7. Postnatal development of BBB ?

- A. astrocyte
- B. pericyte
- C. astrocyte + pericyte
- D. microglial

Answer : C

8. Not found in cerebral tissue ?

- 1)HMG-CO synthase
- 2)glucose
- 3)SCOT
- 4)lactate

Answer : A

9. Cerebral tissue / Brain (utilize/consume) Of total body glucose utilization ?

- a. Quarter
- b. Two quarter
- c. Third
- d. Half

Answer : A

10. Which of the following does not happen in brain ?

- a) pyruvate convert to lactate
- b) pyruvate convert to acetyl-COA
- c) lactate convert to pyruvate
- d) glucose phosphorylation to G6P
- e) G6P dephosphorylation to glucose

Answer : E

CNS-Biochemistry **Lecture 2**

11. In breastfed neonate the primary and main source of energy is numerous?

- A- glucose only
- B- ketone body
- C- glucose, acetoacetate, B hydroxybutyrate
- D- mannose

Answer : C

12. All of the following are true about the fate of excess 4.4 mmol of glucose, EXCEPT ?

- a. Synthesis of glycogen in neuron
- b. Utilized in the synthesis of glutamate
- c. Utilized in the synthesis of GABA

Answer : A

13. All of the following are true about the fate of excess 4.4 mmol of glucose, EXCEPT ?

- a. Component of BBB
- b. Utilized in the synthesis of brain neurotransmitters

Answer : A

14. Which GLUT protein is specific for neurons ?

answer : GLUT3

15. More than 70% of ATP molecules generated in brain tissue are consumed in ?

answer : pumping ions actively against their concentration gradients by Na⁺/K⁺ ATPase pump

16. What is the most energy-consuming process in the brain ?

- a. Restoring ionic gradient across the plasma membrane after excitation
- b. Passive transport of Na⁺/K⁺ pump

Answer : A

اللهم بارك لنا في أوقاتنا وأعمارنا، ووفقنا لما فيه
خير لنا ولأمتنا، وارزقنا همة لا تفتقر وعزيمة لا يلين،
وانصر أهلنا في غزاة نصرنا عزيزاً مؤزراً، وافتح لنا
أبواب النجاح والتوفيق برحمتك يا أرحم الراحمين.

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Lecture 3

Neurotransmitters 1

Corrected By :

Mahmood jamal

1 How does the neurotransmitter produce a signal in the postsynaptic cell?

a. Binding to postsynaptic receptor .

2) All of the following are true about Serotonin except?

A Like acetylcholine

B Stimulates GABA .

C When it accumulates in thalamus it stimulates sleep

D When it accumulates in cortex it stimulates arousal

Ans: B

3 The junction between two communicating neurons is

a.Synapse .

b. Neuromuscular junction

c. Dendrite

d. Axon

e. Receptor

Ans: a

4 Neurotransmitters may be excitatory or inhibitory. The main excitatory neurotransmitter of the central nervous system is?

a.Glutamate .

b. GABA

c. Glycine

d. Acetylcholine

e. Serotonin

Ans: a

5 Which of the following matched pairs are NOT TRUE?

a. Mania and depression- Imbalance Ach

b, Papez circuit- Establishing the emotional significance of memory for the purpose of life

c. Damage Papez circuit- Alzheimer's disease

d. Fornix- Major output tract of the hippocampus in Papez circuit

e. Schizophrenia- Caused by decreased dopamine .

Ans: e

6 Which of the following is correct about Metabotropic Receptors?

Answer :Comprise a single protein subunit, winding cell membrane seven times
(transmembrane domains)

7 Neurotransmitter in alzahimer ?

- A)ach .
- B)glutamate
- C)dopamine
- D)serotonin

Ans: A



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Lecture 4

Cerebrospinal fluid

Corrected By :

Raneem Bashtawi

1. When a doctor took a lumbar puncture for his patient, the CSF was red in the beginning and later changed, what does that mean?

A. The doctor punctured the blood vessels (traumatic tap)

2. Which of the following is true about a case of tuberculosis meningitis?

a. A pellicle forms and it is a prominent feature

All the following are true except

A- csf produced from 3rd , 4th ventricle and subarchinoid space

B- csf go to blood through villi

Answer: A

