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Lecture 1

Brain Energy Metabolism I

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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+/ Ca+2 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.

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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 .

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االأسئلة 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.