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MSK Block

Review Questions





Aerobic & Anaerobic Metabolism in Muscle



Q1-What type of metabolism is more suitable for high intensity exercise?

A- Aerobic metabolism B-Anaerobic metabolism

Q2-Which of the following systems is metabolized aerobically?

A-Short-term system B-Long-term system C-Immediate system D-None of the above

Q3-Which of the following systems have the shortest

duration of action?

A-Short-term system B-Long-term system C-Immediate system D-None of the above

Q4-What is the most important form of energy in our cells?

A-NADH B-Glucose C-FADH D-ATP

Q5-How is energy released from ATP molecules?

Q6-What is the main ATP synthesis pathway?

A-Oxidative phosphorylation B-Citric acid cycle C-Reductive phosphorylation

Q7-What is the name of the mitochondrial pathway that catalyzes the oxidative phosphorylation pathway?

Q8-Which one of the following enzymes is used in the oxidative phosphorylation pathway?

A-Pyrophosphatase B-Phosphatase C-ATP Synthase D-Phosphoglucomutase

Q9-Red fibers depend mainly on?

A- Aerobic metabolism B-Anaerobic metabolism

Q10-Which muscle fiber type is suitable for fast, strong contractions?

A-Type I B-Type II C-Red fibers

Q11-Which muscle fiber type are suitable for prolonged effort?

A-Type I B-Type II C-White fibers

Q12-White fibers depend mainly on?

A- Aerobic metabolism B-Anaerobic metabolism

Q13-White fibers are able to form sufficient ATP even when there is little oxygen available, why?

Q14-Red fibers provide their ATP mainly from?

A-Proteins B-Carbohydrates C-Fatty acids

Q15-Why type 1 fibers are red in color?

Q16-What is the main role of myoglobin in red fibers?

Q17-What is the name of catabolic process by which fatty acid molecules are broken down in the mitochondria to generate Acetyl-CoA?

A-Kerbs cycle B-beta-oxidation C-Respiratory chain

Q18-Fatty acids can be used in?

A-Anaerobic metabolism B-Aerobic metabolism C-Both

Q19-Why is anaerobic metabolism suitable for high intensity exercises?

Q20-In anaerobic metabolism, for what reason NADH+H+ is re-oxidized?

Q21-In Cori cycle, what is the name of the process that occur in liver?

A-Glycogenesis B-Glycolysis C-Glycogenolysis D-Gluconeogenesis

Q22-Why skeletal muscles can’t produce new glucose from lactate?

Q23-Liver always has sufficient ATP for gluconeogenesis, why?

Q24-Formation of alanine from pyruvate & NH2 occurs in?

A-Liver B-Blood C-Muscle D-Kidney

Q25- What is the fate of alanine in liver?

Q26-Which one of the following stimulate AMPK?

A-$\uparrow $ NADH B-$\uparrow $ NAD+ C-$\uparrow $ ATP D-$\uparrow $ AMP

Q27- Activation of AMPK lead to?

A-Catabolic pathway (off) B-Anabolic pathway (off) C- Gluconeogenesis (on)

Q28-What is the aim of AMPK activation?

Q29-AMP-activated protein kinase play a direct role in regulating cellular energy during?

A-At rest B-Sleeping C-Exercising D-All of them

Q30-Activation of AMPK lead to all of the following except?

A-$\downright $ Gluconeogenesis B-$\downright $ Fatty acid oxidation C-$\downright $ Cholesterol genesis D-$\downright $ Lipogenesis

Q31-Which one of the following can cause muscle fatigue?

A-Muscle expansion B-Hydration C-Lactic acid accumulation D-None of them

Q32-With appropriate training, Athletes are able to?

Q33-Targeted training provides athletes with?

A-High endurance during muscle activity

B-Efficient energy production and consumption

C-Delayed fatigue

D-All of them

Q34-What is the fate of amino nitrogen in protein degradation? (Taken from Team435)

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| Answers |
| Q1 | B |
| Q2 | B |
| Q3 | C |
| Q4 | D  |
| Q5 | By Breakdown of ATP into ADP+PO4  |
| Q6 | A |
| Q7 | Respiratory chain  |
| Q8 | C |
| Q9 | A |
| Q10 | B |
| Q11 | A |
| Q12 | B |
| Q13 | They are  |
| Q14 | C |
| Q15 | Due to myoglobin |
| Q16 | serves as a reserve supply of O2 |
| Q17 | B |
| Q18 | B |
| Q19 | During intense muscle activity O2 supply from blood quickly drops $(\downright )$ |
| Q20 | To maintain glucose degradation and ATP formation  |
| Q21 | D |
| Q22 | Because gluconeogenesis requires much more ATP than is supplied by glycolysis in muscle  |
| Q23 | Cause Oxygen deficiencies do not arise in the liver  |
| Q24 | C |
| Q25 | Alanine is resynthesized into pyruvate, and NH2 is incorporated into urea for execration |
| Q26 | D |
| Q27 | B |
| Q28 | ATP production |
| Q29 | C |
| Q30 | B |
| Q31 | C |
| Q32 | -Changing the proportions of red and white muscle fibers - Changing the expression of muscle proteins |
| Q33 | D |
| Q34 | During protein degradation in muscles NH2 is released. It is a very toxic substance. The amino group (NH2) transported from the muscle to the liver in the form of alanine is converted to urea in the urea cycle and excreted |