MCM Practice Questions: Lecture Day 1

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Lecture 4: Enzyme and Isoenzymes II

1) A young child is diagnosed with Maturity Onset Diabetes of the Young: Type 2 (MODY 2). This condition is caused by a genetic disorder of the enzyme that catalyzes the first step of glycolysis and has a high Km value for glucose. What enzyme is affected?

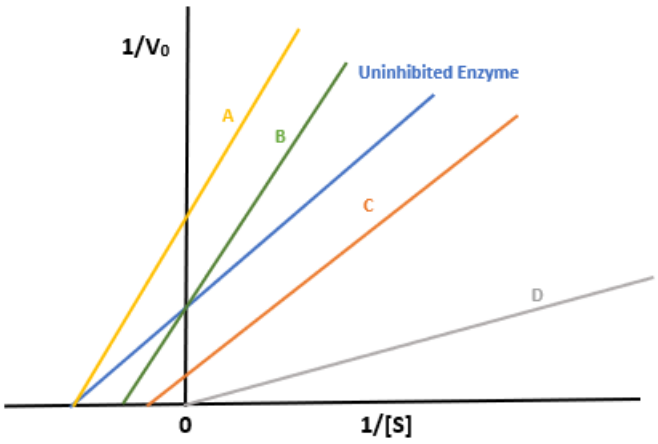
(A) Hexokinase

(B) Glucokinase

(C) Glucose-6-Phosphatase

(D) Glucose Dehydrogenase

2) A 43-year-old male patient goes to his physician for an annual physical. After running routine labs, the physician notices that the patient's cholesterol levels are high and in need of treatment. He prescribes a statin to reduce cholesterol synthesis. From the graph below, choose which Lineweaver-Burk plot line corresponds to the action of inhibition the statin will have on HMG-CoA reductase.



(A) A

(B) B

(C) C

(D) D

3) A patient presents to the ED with undifferentiated chest pain. The nurse collects blood from the patient and sends it for analysis. When the results come back, the elevated levels of this blood protein confirms the patient is having a myocardial infarction. What protein is this?

(A) Alanine Aminotransferase (ALT)

(B) Aspartate Aminotransferase (AST)

(C) Myosin

(D) Troponin

4) An aid worker presents to the ER in a weak state. The patient has been suffering from diarrhea and severe vomiting. The aid worker has recently returned from a deployment to Angola. The lab runs a stool sample and determines that the patient has been infected with *Vibrio cholerae*. What G-protein does this disease affect?

(A) Gs

(B) Gi

(C) Go

(D) Gp

5) Karan has been fasting for 6 hours and his blood sugar levels are falling. In order to maintain normal levels of blood sugar, his body starts engaging in glycogenolysis. The enzyme that catalyzes the first step of the process is called Glycogen Phosphorylase. However, this enzyme is allosterically activated by another protein; what is the name of that protein?

(A) Glycogen Phosphorylase Kinase

(B) Calmodulin

(C) Calsequestrin

(D) Phosphofructokinase

6) When your body has a high amount of cholesterol, the rate limiting step in sterol synthesis, HMG-CoA reductase, is downregulated. This control is affected at the gene transcription level. What protein do sterols bind to in order to achieve this result?

(A) SREBP

(B) SREBP Cleavage- activating protein

(C) OSBP

(D) SRE