NAME: _____

1. Starting with 1 mL of a stock solution of 45 mM cholesterol in chloroform, explain how to prepare the solutions to create a standard curve with data points for 0.5; 1; 2; 4; 6; and 10 mM cholesterol. You need 0.5 mL of each standard solution.

2. Statin drugs target HMG-CoA reductase not HMG-CoA synthase. Why?

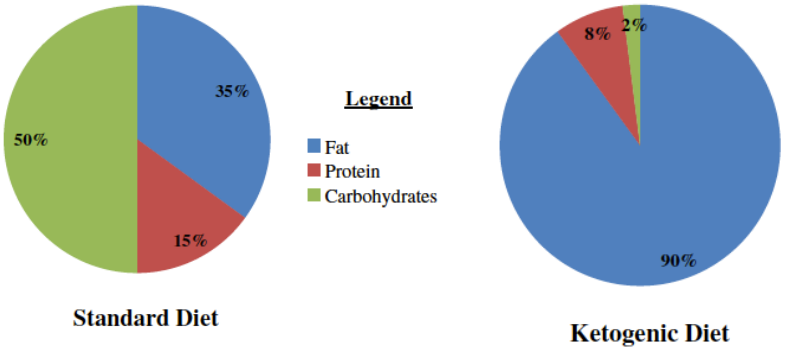
3. Imagine that you have the GC/MS instrument to monitor metabolites in real time from cell cultures treated with various molecules. You try various combinations of DMSO (a negative control); antimycin A (a Complex III inhibitor); oligomycin (an ATPase inhibitor); and DNP (a membrane localized molecule that rapidly equalizes the pH across a membrane). You observe the following results:

	DMSO	antimycin A	antimycin A + DNP	Oligomycin	Oligomycin + DNP
Ratio NADH/NAD+	moderate	high	high	high	moderate

a. Why is the ratio of NADH/NAD^+ for cells treated with antimycin A and Oligomycin high as compared to the negative DMSO control?

b. Why is the ratio of NADH/NAD^+ returned to the negative DMSO control level when DNP is added to cells treated with oligomycin but not antimycin A?

4. Compare the ketogenic diet to the standard diet. Fill in each cell in the table below with either "High" or "Low" for a patient after consuming a meal on the standard diet on a regular basis or for a patient after consuming a meal on the tenth day of a ketogenic diet.



Standard Diet Ketogenic Diet

	Standard Diet	Ketogenic Diet
Blood Glucose Concentration		
Insulin Blood Concentration		
Glucagon Blood Concentration		
Hepatocyte cAMP Concentration		
Phosphorylation of Metabolic Enzymes		
Hepatocyte Glycolysis		
Hepatocyte Gluconeogenesis		
Hepatocyte Glycogenesis		
Hepatocyte Glycogenolysis		
Hepatocyte Ratio NAD+/NADH		
Hepatocyte ATP		
Hepatocyte β-oxidation		
Hepatocyte Fatty acid Synthesis		
Hepatocyte Ketogenesis		
Hepatocyte TCA flux		

5. List the metabolic pathway fates for each of the following:
   a. Glucose-6-phosphate

   b. Pyruvate

   c. acetyl-CoA