

CHEM 495. Topics: Biochemistry, Physiology and Neurochemistry of Beer, Wine and Alcohol.
Intersession (Rome) 2023

Block III - Possible Exam Questions

- 1) In addition to water/lipid volume ratios, there are a number of genetic factors that influence the impact of Ethanol between genders. Outline the reasons on body-type and two genetic differences (AND THE biochemical mechanism) that modulate the risk of alcohol use and disorder between men and women.
- 2) There is a balance required between ADH and ALDH to minimize the concentration of acetaldehyde. Moving from the stomach, to the liver to the brain, describe the rate of metabolism in people with wild-type ADH and ALDH at low, moderate and high levels of ethanol blood concentration. Hint – use the numbers found in your handout for the mM concentrations of ethanol and the K_m/V_{max} to start your answers.
- 3) There are several polymorphisms of both ADH and ALDH in various populations. Pick one or two of each enzyme and describe the impact on alcohol use disorder and potential disease.
- 4) There are a LOT of “hacks” to avoid a hangover. Using your new knowledge of biochemistry, what is a hangover, how is it caused and pick your favorite “hack cure” from hangovers and explain if the cure is valid or not.
- 5) Using concentrations of ethanol and affinity for ethanol explain how ADH is the prime metabolic pathway of ethanol and when/how P450 would be an important part of ethanol metabolism. What is the consequence of prolong/chronic P450 metabolism of ethanol?
- 6) Chemically (think reactivity – organic chemistry...) why is acetaldehyde so “reactive”? What are the targets and consequences of production of acetaldehyde?
- 7) In general, explain the biochemical mechanism and process of chronic alcohol use that is harmful to our bodies. Analyze the cause and effect of one of the alcohol metabolic diseases we discussed.