How does Alcohol Affect the Development of Zebrafish Embryos

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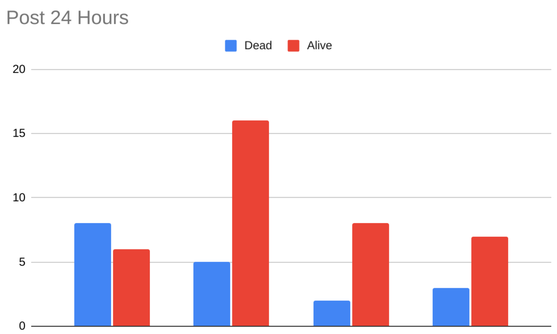
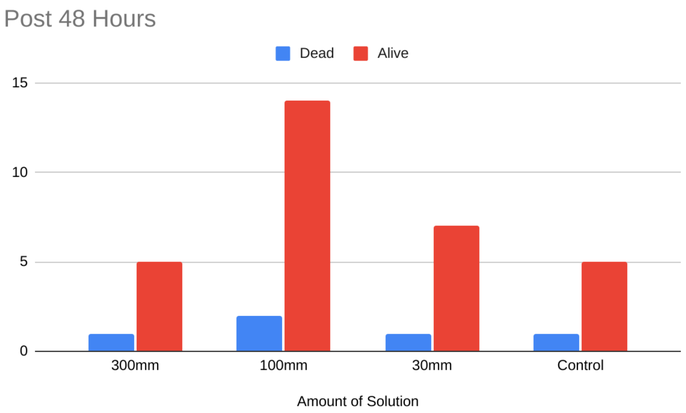
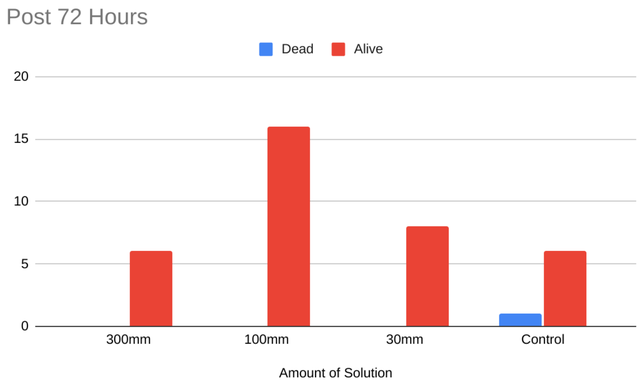
Abstract:
In this experiment we tested the effects of different concentrations of alcohol on zebrafish embryo to see how it would affect their growth and development. The entire point of this experiment was to prove how alcohol slowed the development of a human embryo. We tested on Zebrafish because we share 70% of our genes with the zebrafish. As the experiment went on we observed that the higher the concentration the slower the development of the embryo. Hence our statement, alcohol does hurt the body and will affect your child's growth. It is known to have certain effects on humans and Zebrafish such as defects in the brain, heart, eye, and inner ear due to alteration of expression of many genes involved in neuronal specification, neural growth factors, cell growth, and hematopoiesis.

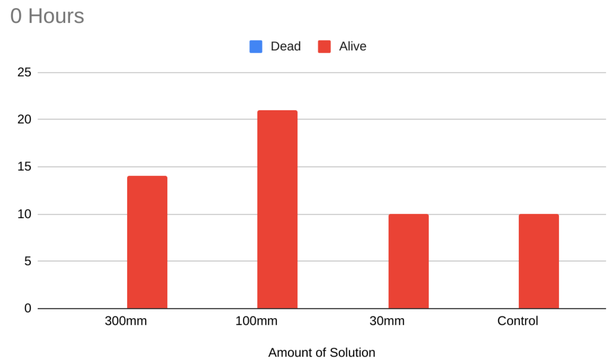
Introduction:
Alcohol causes to harm of the liver and can eventually lead to diseases like hepatitis, jaundice and cirrhosis in the human body. Humans are far stronger than zebrafish embryos and just imagine what alcohol could do to a weak, developing embryo. We tested alcohol on zebrafish embryo to see how it might affect their growth and development and then compare it to humans to see how it might affect us.

Materials and Methods
We followed a detailed procedure to find the effects alcohol had on Zebrafish embryo. We first prepared our different solutions of alcohol. Our first solution was the embryo media or the control. The second solution was the 30mm Alcohol solution. The third solution was the 100mm solution and the last solution was the 300 mm solution. We set about 10 zebrafish embryo in each well and each well contained a different solution. And we observed how many were dead or alive throughout different time periods up to 72 hours. And from the observations that we made we could conclude that the alcohol affects zebrafish embryo and compare it to how it might effect humans.









Results:
We started with the four wells of different concentrations where there were about 10 fish in each well. The amount of fish alive in the more concentrated wells was cut in half overnight while only two or three died in the less concentrated wells. On the second day, none died in the highest concentration, one died in the second highest, none died in the third and one died in the control. On the third day some of the fish were hatched in the less concentrated wells but no fish ever hatched in the highest concentrated well.

Sources:
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https://pubs.niaaa.nih.gov/publications/arh27-4/285-290.htm#:~:text=The%20major%20reactive%20molecules%20participating,(chemically%20known%20as%20ethanol).

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Discussion:
When we increased the amount of alcohol throughout the experiment we observed that as the zebrafish embryo were exposed to higher concentrated alcohol solutions, the slower the development of the embryo. The scientists hypothesis that the development of the zebrafish embryo will be slowed down was correct. We think the reason for this could be the contaminants that are in alcohol. Alcohol contains aldehydes, MDA (a controlled substance in most other countries), ethanol, and HNE (excessive alcohol and illicit drug use that can have a serious effect). These contaminants affect humans with slurred speech, impaired judgement, impaired sensory and motor skills, and uninhibited behavior (not normal behavior). Our group thinks the zebrafish embryo died because of the harmful chemicals that are contained within the alcohol. When a pregnant mother consumes alcohol the babies brain loses the capability to recover from alcohol which in turn leaves the brain unable to signal propper growth. That is what we think happened to the zebrafish embryo in this experiment and why they did not develop the way they should have.