Is there a difference in the gene expression between the liver and intestine for *Schistosoma mansoni*

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Introduction

Schistosoma mansoni are a species of parasitic worm. They lay their eggs in the intestines of human hosts and are excreted back into the wild. Where they will find a host snail the eggs then infect the snail until they reach full maturity. Once they reach the larva stage. They then crawl out the snail and end up in the water where they try to infect a human by burrowing through the skin. Where they end up laying their eggs.

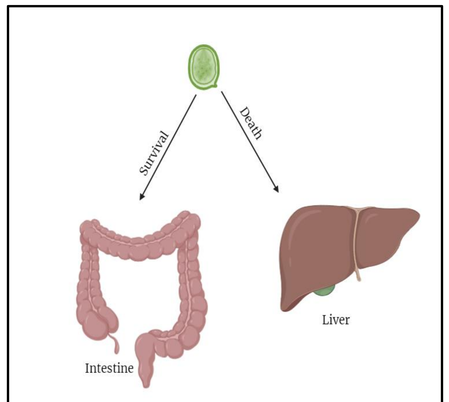

Figure 1. The path that the *Schistosoma mansoni* eggs take.

However, some of these eggs don't reach maturity since they end up landing in the liver where they would eventually end up dying. Although these eggs in the liver don't continue their life cycle, they still grow and express significant transcriptomic information that can be examined. Scientists have used the eggs in the liver for many years on their experiments since they are easier to collect. So if there is a significant difference then all those decades of research are in jeopardy. We wanted to see if there is any significant difference between the liver and the intestinal groups by using bioinformatics tools to examine their RNA.

Methods

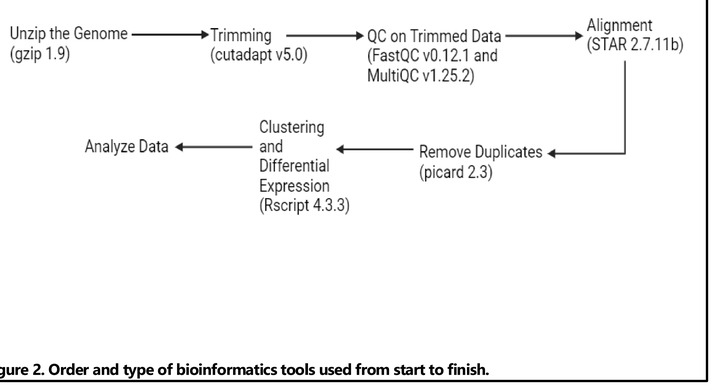

Figure 2. Order and type of bioinformatics tools used from start to finish.

(A) Unzipping and trimming data

The transcriptomic data was collected unzipped and examined. Then the duplicate genes were trimmed out since there is no use in running analysis on the same gene twice.

(B) QC and Alignment

QC was performed on the data to see which samples could be used. Then they were aligned with each other to see how much variance was between the liver and intestine groups.

(C) Removing duplicates and Clustering/Differential expression

Duplicate sequences were removed and then the nonduplicates were counted. After counting we ran a PCA test on them to see where there would be high concentrations of groups.

Results

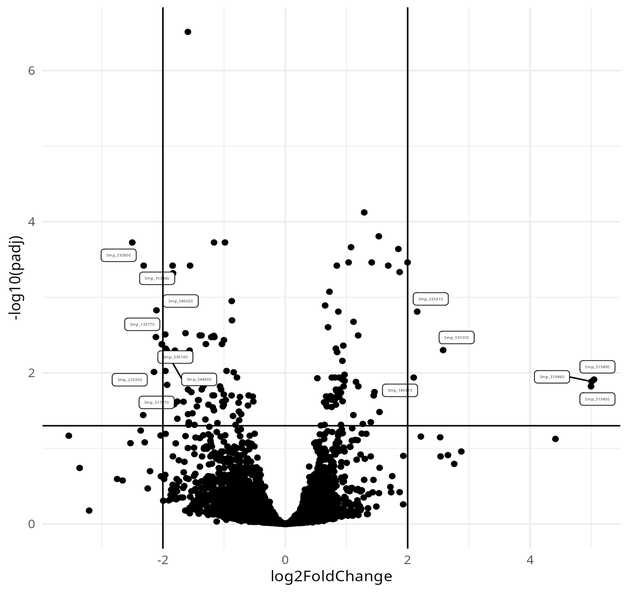

Figure 3. Volcano plot of the transcriptomic differences in the eggs.

Key Findings

- *Schistosoma mansoni* genes can be analyzed using bioinformatics tools. Fig .2
- Using PCA clustering we can say that there is a difference between the Liver and Intestinal groups. Fig .4
- We can see the genes that were statistically significant by the way that they are both above and not between the lines. Fig .3

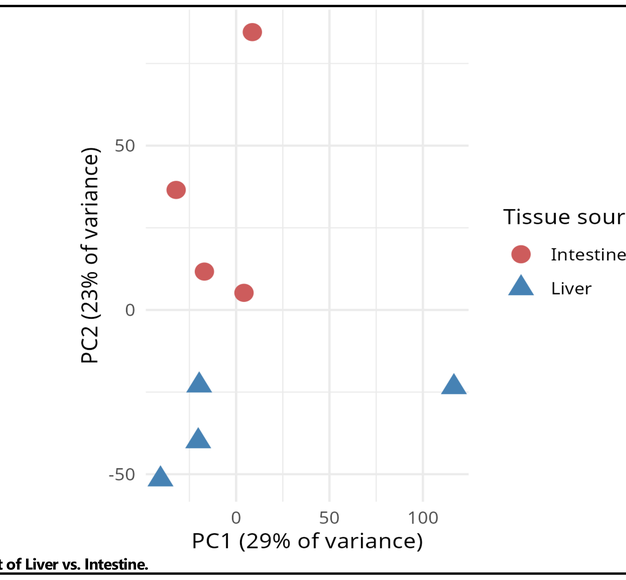

Figure 4. PCA plot of Liver vs. Intestine.

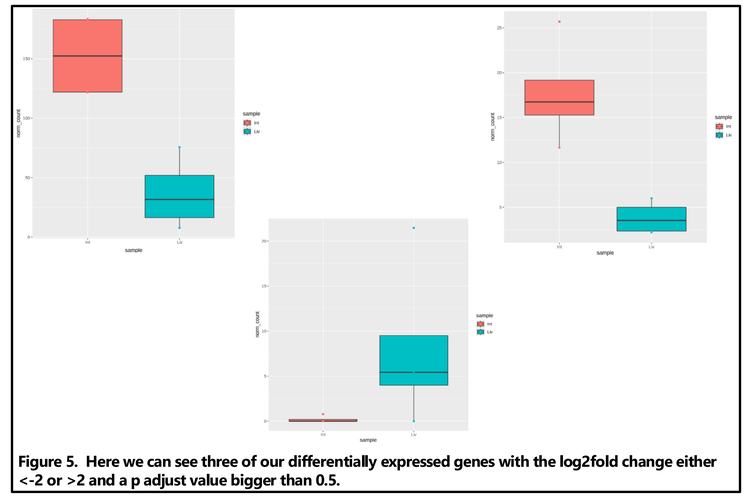

Figure 5. Here we can see three of our differentially expressed genes with the log2fold change either <-2 or >2 and a p adjust value bigger than 0.5.

Future Directions

- We will research other parasitic species to see if there is a trend in this type of data
- We will analyze if there are any other host organisms that would give these results.
- We will figure out why we examined these results and the survival mechanisms behind them.

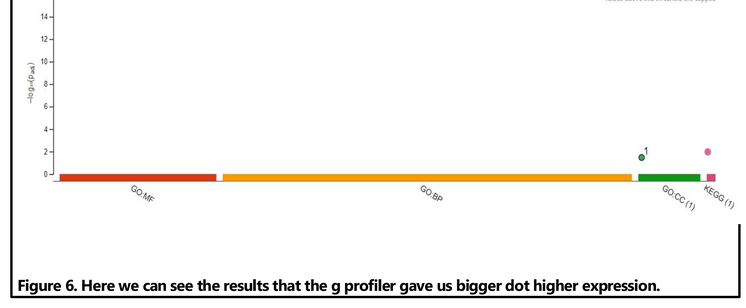

Figure 6. Here we can see the results that the g profiler gave us bigger dot higher expression.

References

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