Final Project DSCI 512

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I picked [] as the dataset for my final project. This paper studied the effect of acetic acid exposure on transcriptome and other type of phenotypic data. The authors of this paper exposed S. cerevisiae to 150 mM concentration of acetic acid at pH 3. This means that acetic acid is in undissociated form in the environment and could enter the cell easily. They picked this level to make sure that the cells cannot restore pH to neutral which is observed for bellow 60 mM. They ran **three identical experiments for both controls and acetate treated reactors** and took samples at 45 min and 120 min and 200 min. Two samples from the replicates per time point. The main research question in this study was to explore the changes across the entire transcriptome after acetic acid exposure.

Biofuel production is a promising way mitigate climate change. S. cerevisiae provides a robust platform for bioethanol production. Acetic acid as a microbial product can lower the efficiency of ethanol production and in turn the feasibility of the entire process. Acetate poisoning is a well-known problem in anaerobic digestion as well []. The effect of acetate on metabolic pathways can extend beyond S. cerevisiae and be applied to other organisms. Some researchers attribute the lower efficiencies of fermentation products to thermodynamic limitations. However, this study shows that the effect is more related to biochemical interactions rather than thermodynamic limits.