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The Effect of pH on the Efficiency of Transformation

The purpose of this project is to determine whether a change in pH levels will hinder or promote the rate of transformation of plasmids. The initial hypothesis is that moderate pH buffers (5-7) would facilitate transformation by increasing the cation concentration to shield the adhesion zones in the bacterial cell wall. For this experiment the protocol for a basic transformation experiment was modified to include the introduction of buffers from pH 5 to pH 9. E. coli k-12 were introduced to plasmid DNA that contained the gene for ampicillin resistance and for the disruption of metabolism of β–galactodase. Transformed cells were then plated on three different types of media (LB, LB Amp, and LB Amp/ X-gal), to determine if the cells had obtained the desired plasmids. Two different trials of the experiment have been conducted, each with the materials from the same shipment. At this point the data is conclusive, due to a lack of transformation of any cells, including the control group. This indicates a potential problem either in the protocol or with the materials used. Based off of previous experience with this protocol, it is hypothesized that something occurred during the shipment of the materials (plasmids) damaging them and resulting in the lack of transformation. For now it is unknown whether or not the different buffers effected the transformation. Additional trials will be conducted with new materials.