# Testing the Geometrical and Chemical Structure of Methylbutenol Synthase: Finding a New Method for Rubber Production

Haque, Zaid

The purpose of this experiment is to see if changing the chemical structure of Methylbutenol (MBO) synthase's active site from a Phenylalanine to a Tyrosine will effect the production of MBO and isoprene. By finding alternative ways to increase the production of MBO and isoprene, it will allow for an increase in rubber production and various uses in biotechnology. It was hypothesized that with the chemical and geometrical change, a greater production of MBO and isoprene will be produced because Tyrosine is polar due to the hydroxide group. The experiment was conducted by using proteins from last year, which went through a site directed mutagenesis. Next, the proteins underwent a protein expression was applied by suspending bacterial cells, vortexing, and then centrifuging the bacterial cells. The supernatant was run through a western blot. The gel was then colored in order to see the bands of protein. A functional assay was used the protein and cycled through a gas chromatograph. The results showed that there was a significant change in the amount of MBO and isoprene production. The ratio had a slight shift toward the production of isoprene. This shows that the geometry and the chemistry had an effect on MBO synthase.

**Awards Won:**