Vitamin A deficiency causes blindness in over 250,000 children annually. The WashU iGEM team hopes to address this issue by creating a transgenic strain of *Saccharomyces cerevisiae* (baker’s yeast) that produces beta-carotene, the precursor to vitamin A. The carotenoid biosynthesis pathway consists of four genes found naturally in the organism *Xanthophyllomyces dendrorhous*. Three of the four enzymes are required for beta-carotene production while a fourth enzyme cleaves beta-carotene to form beta-ionone, a rose-scented compound used in the fragrance industry.

**Objective**

• Clone three enzymes (crtE, crtYB, and crtI) into yeast in order to produce beta-carotene
• Once producing beta-carotene, a fourth gene (CCD1) will be added to cleave beta-carotene into beta-ionone.

**Results and Data**

- **PCR amplification of Synthesized Genes:** CrtI, CrtE, CCD1, and CrtYB
- **PCR amplification of KanMX4, NatMX4, LEU2, and URA3 Cassettes**

**Summary**

Team WashU succeeded in creating expression constructs for each of the four genes in the carotenoid biosynthesis pathway. Subsequently, we have submitted our original biobricked constructs in the "DNA Planning" stage in the Registry of Standard Biological Parts. Despite the fact that we have all of our DNA sequences complete and synthesized, we ran out of time before we could transform our yeast strains or submit our DNA constructs to the Registry of Standard Biological Parts. However, should next year's WashU iGEM team decide to continue this project, the biobricks we submitted would undoubtedly be completed for use by future IGEM teams.