

To provide certainty to protect this vulnerable population, our project intends to create a portable biosynthetic biosensor and bioreporter for the detection of peanut traces in food samples by detecting the allergenic protein in peanuts: Ara-H2. Using a yeast cell because of its compatible cell membrane with our synthetic receptor, our team engineered a yeast cell modified to produce green fluorescent protein (GFP) upon detection of the antigen Ara-H2. This extracellular detection would then signal the gene circuit, including the activator, promoter, and ribosome binding site, to begin transcription to create GFP. The yeast cell would then output GFP as a visual indication of the detection of peanuts. Because the gene circuit for the production of GFP is only activated when the engineered receptor detects the allergen, the visual signal will only be produced if peanuts are present, making this an effective solution to detect peanut allergens.