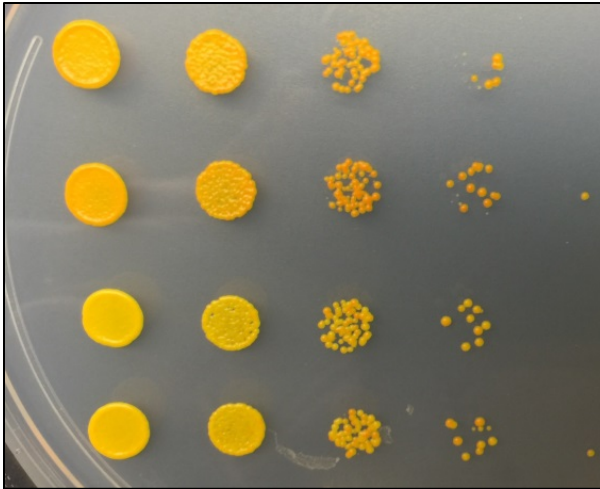


Overview:

Students will apply modern cloning techniques to introduce optimized genes into *Saccharomyces cerevisiae* to metabolically engineer baker's yeast to produce a commercially-important product.



Beta-carotene expression in *Saccharomyces cerevisiae*.
Photo by Dr. Laura Schenkman.

Lectures:

1. Biotechnological applications of yeasts.
2. Growth and life cycles of *S. cerevisiae*.
3. Transformation, recombination, and gene deletion.
4. Genetic crosses and screens using *Saccharomyces cerevisiae*
5. Genetic tools for protein expression in yeast.
6. Metabolic engineering in yeast.

Labs:

1. Deletions in *Saccharomyces cerevisiae*
2. Assembly of multiple codon-optimized heterologous genes and error-prone PCR products.
3. Transformation of yeast and confirmation of constructs
4. Expression study using engineered strains and detection of recombinant product
5. Bioinformatic analyses of metabolic pathways using web