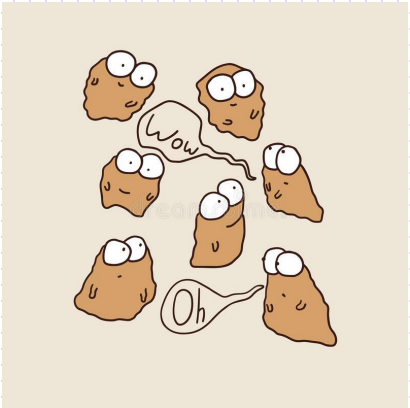
EUROScholars
European Undergraduate Research Opportunities

Genetic Basis of Anti-*Candida* Activity

Zoe Davidson

Supervisors: Professor Patrick Van Dijck, Paul Vandecruys, and Ilse Palmans



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European Undergraduate Research Opportunities

ABOUT ME

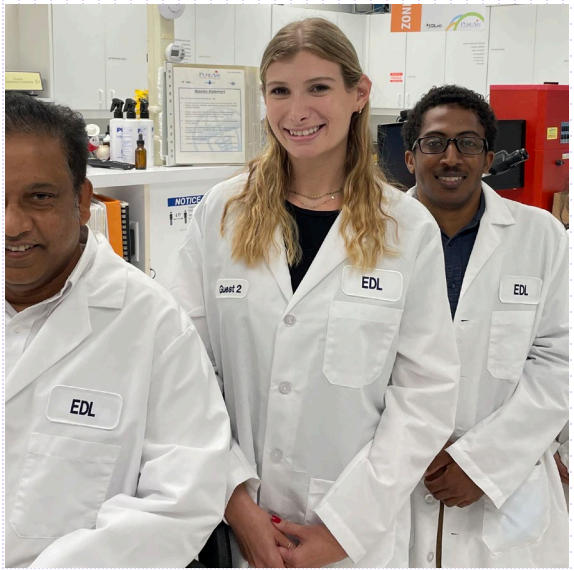
University of Alabama

Major: Microbiology

Minor: Computing Tech & Applications

Host University: KU Leuven

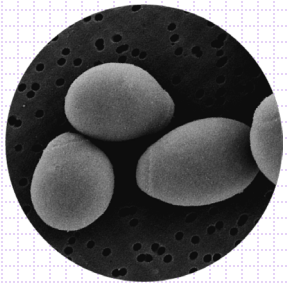
Research interests: Microbiology related to women's health

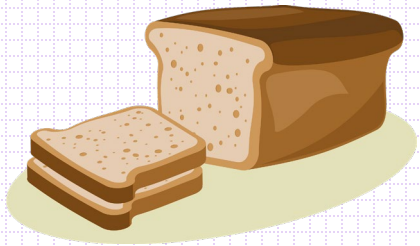


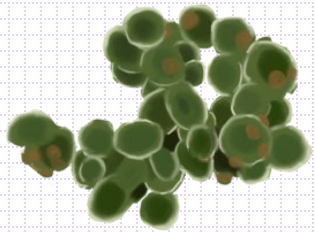
MEET THE MICROBES

Saccharomyces cerevisae

- "Brewer's yeast"
- Model organism

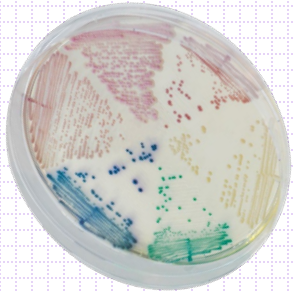


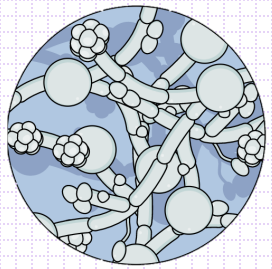


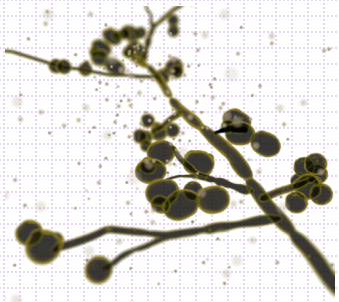


Candida albicans

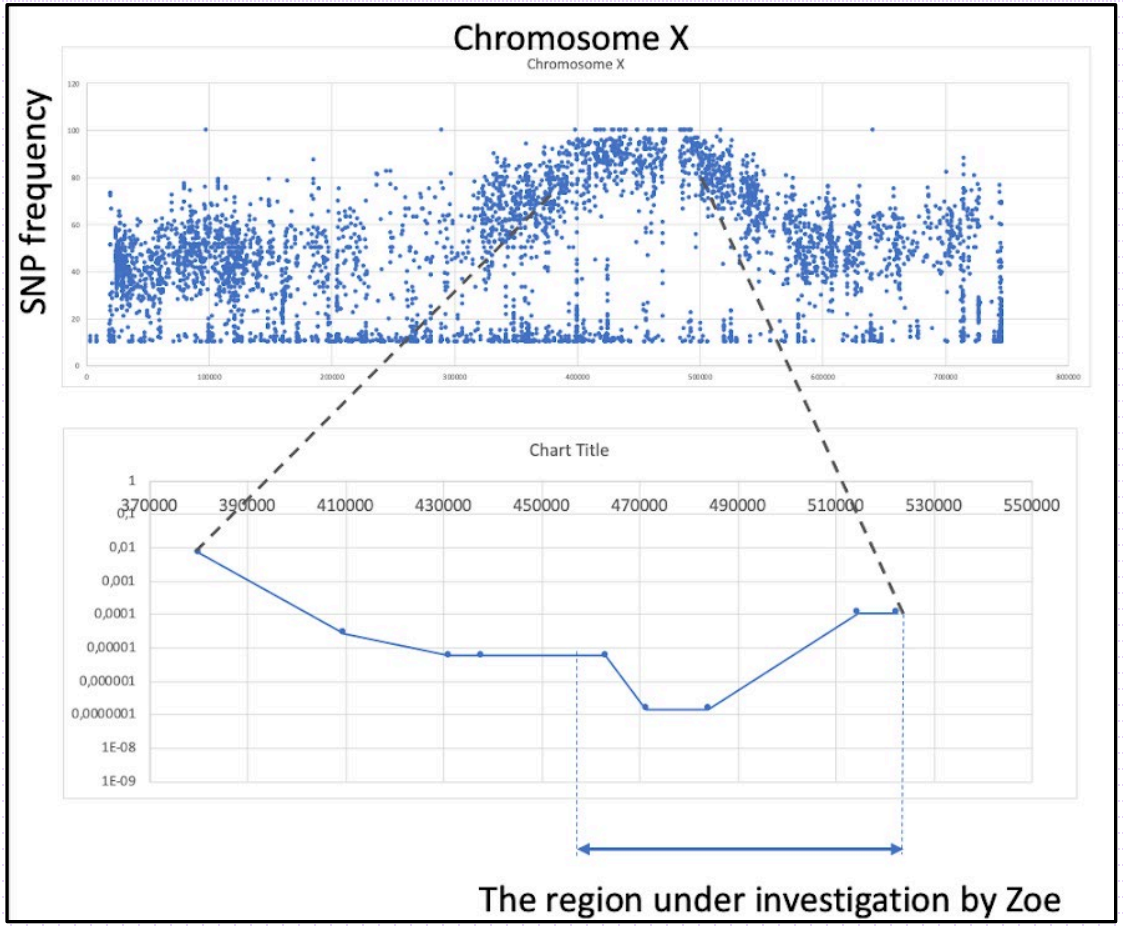
- Opportunistic pathogen in human
- Found on skin, in GI tract, vagina and urethra, under nails, mouth
- Candidiasis – a.k.a. thrush, yeast infections
- 3rd most common cause of hospital acquired bloodstream infections







RESEARCH – INVESTIGATION INTO QTLs



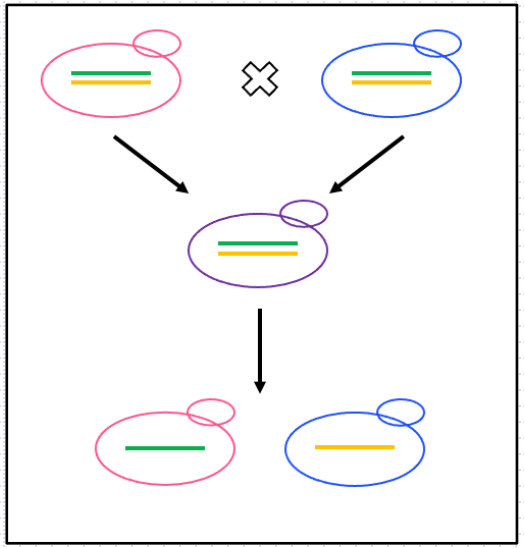
QTL Mapping

- Identifies chromosomal regions
- Measures SNP frequency

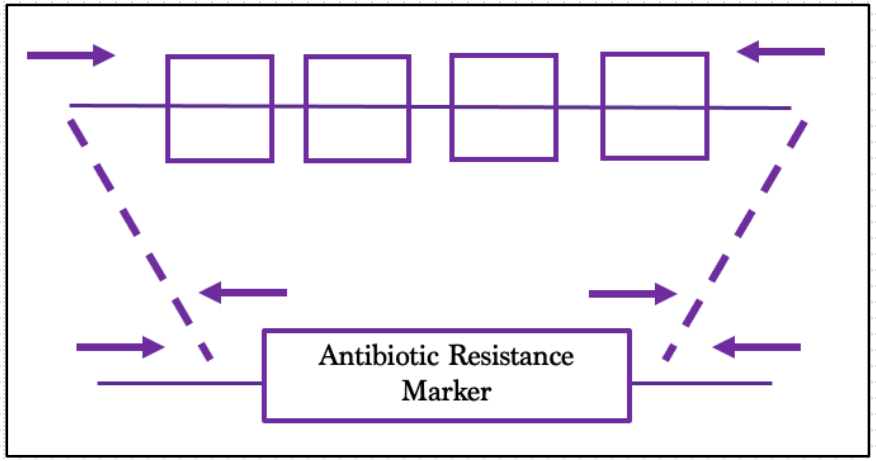
Region under investigation:

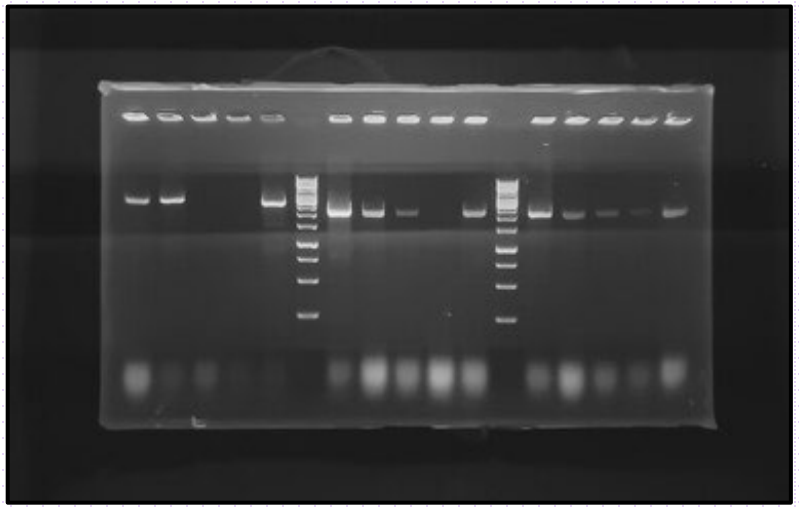
- Blocks 4-6 on chromosome X

METHODS – bRHA

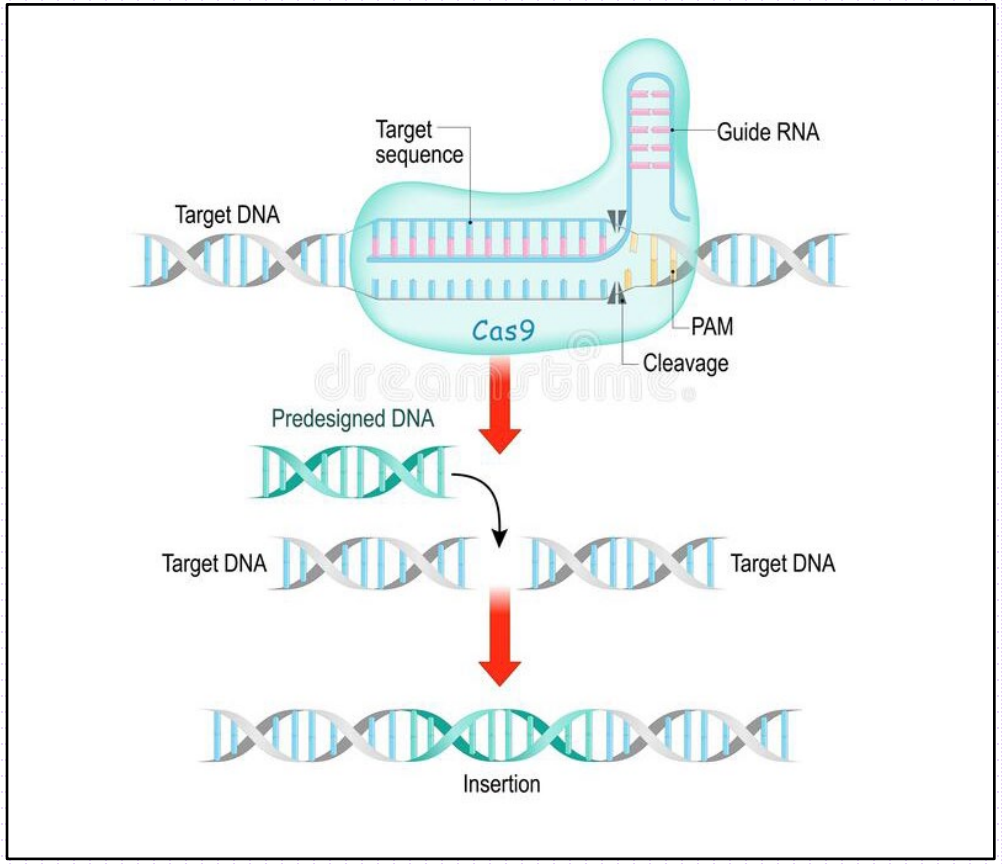


- **bRHA**: Bulk Reciprocal Hemizygosity Analysis
- Compares chromosomal regions by deleting one of two alleles
- Delete large sections of genes using gene knockout
- Use Allele-Specific PCR to confirm deletions





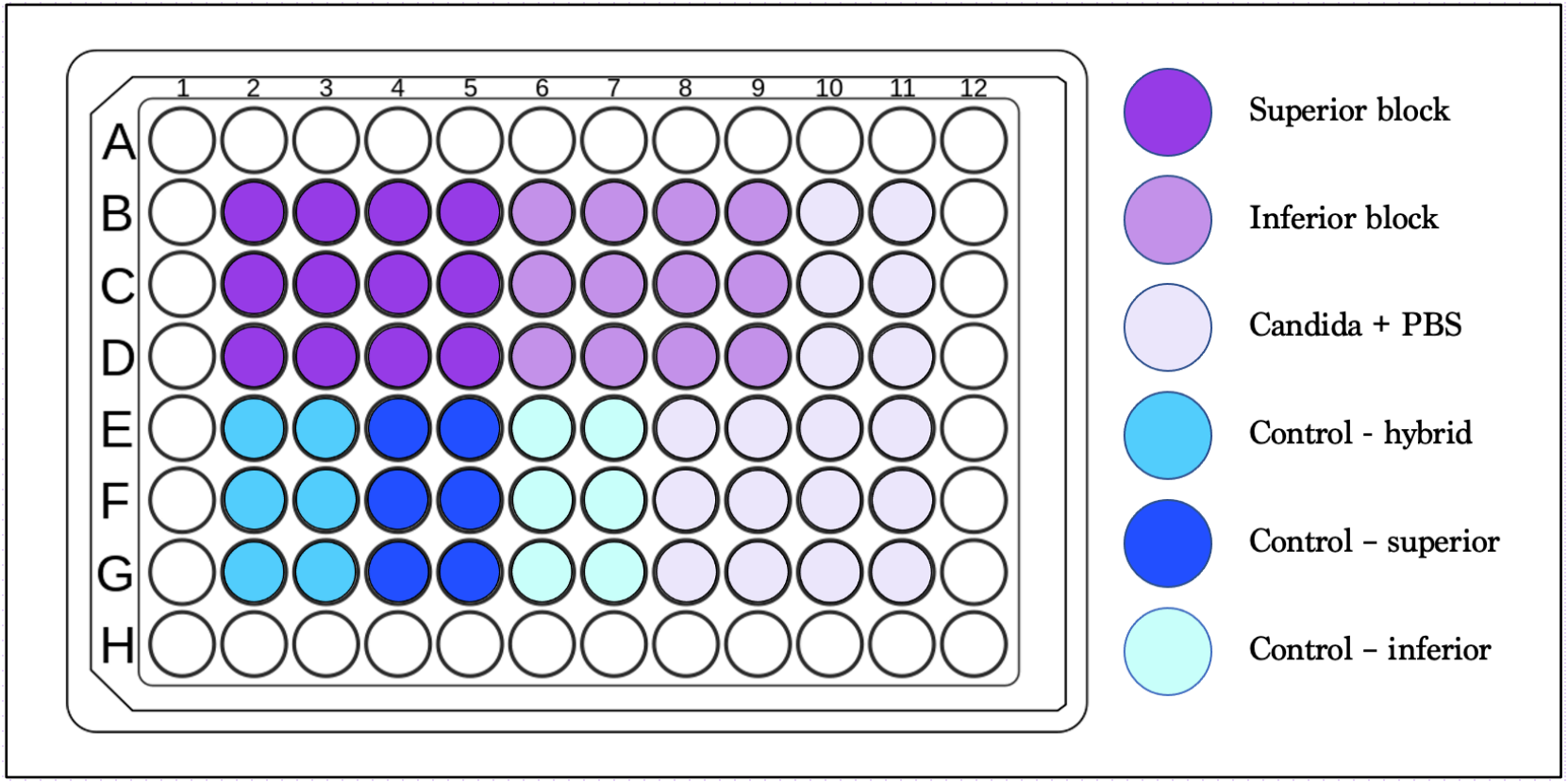
METHODS – Gene Insertion by CRISPR/Cas9



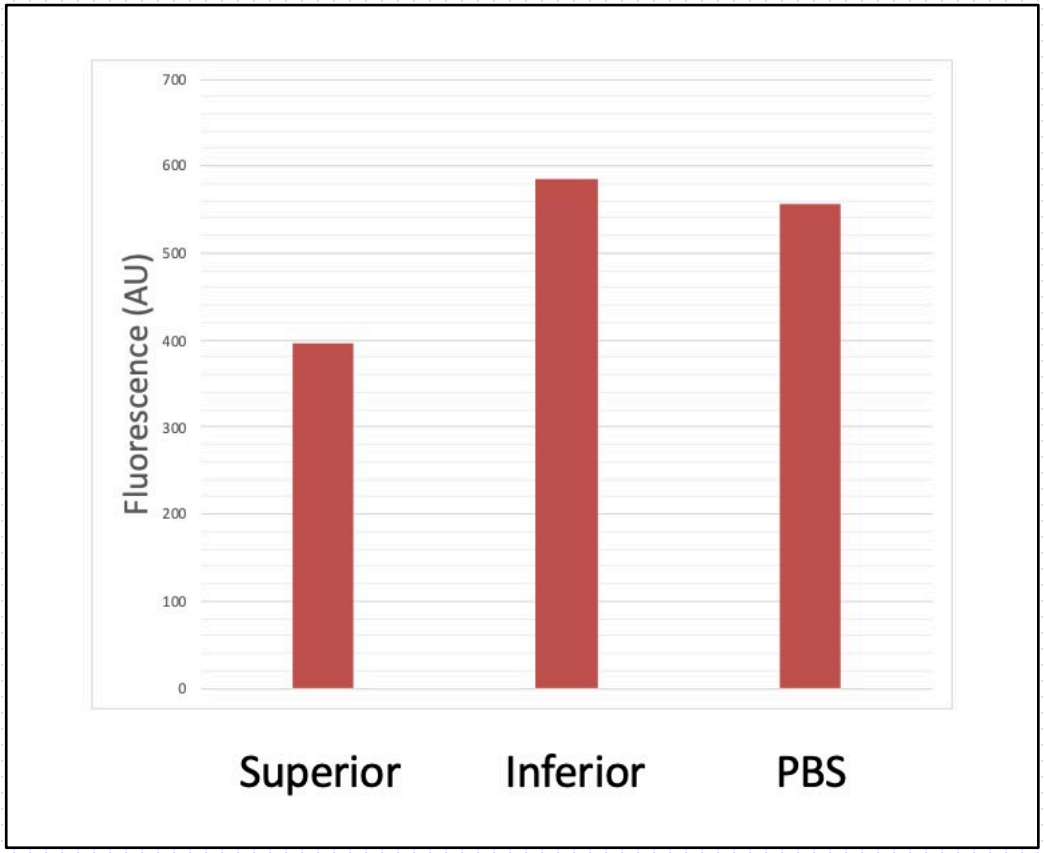
- **CRISPR/Cas9**
- Amplify gene of interest and transform DNA into strains
- OPT2 gene: Oligopeptide 2 transporter

METHODS – INHIBITION ASSAYS

- Measure growth inhibition of *C. albicans* by *S. cerevisiae* using fluorescence



EXPECTED RESULTS



Identify causative gene in superior parent

Thank you!
Roll tide