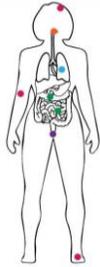


Tetraploid *C. albicans* adapt rapidly and robustly to caspofungin drug stress

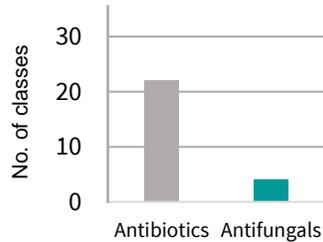
O Avramovska and MA Hickman

Genetics & Molecular Biology, Emory University, Atlanta, Georgia

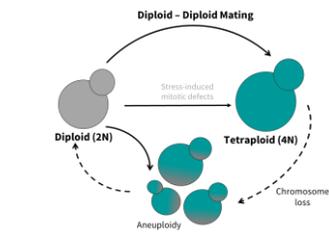
C. albicans, an opportunistic fungal pathogen



Colonizes oral cavity, skin and urogenital tract but can lead to serious infection in immunocompromised individuals.

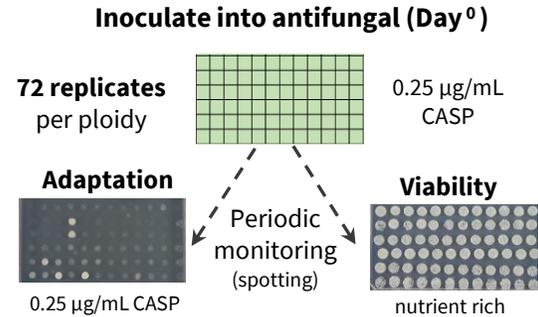


Increasingly difficult to treat, with only 3 types of antifungal classes available, and resistance on the rise. Caspofungin and fluconazole are most frequently used.



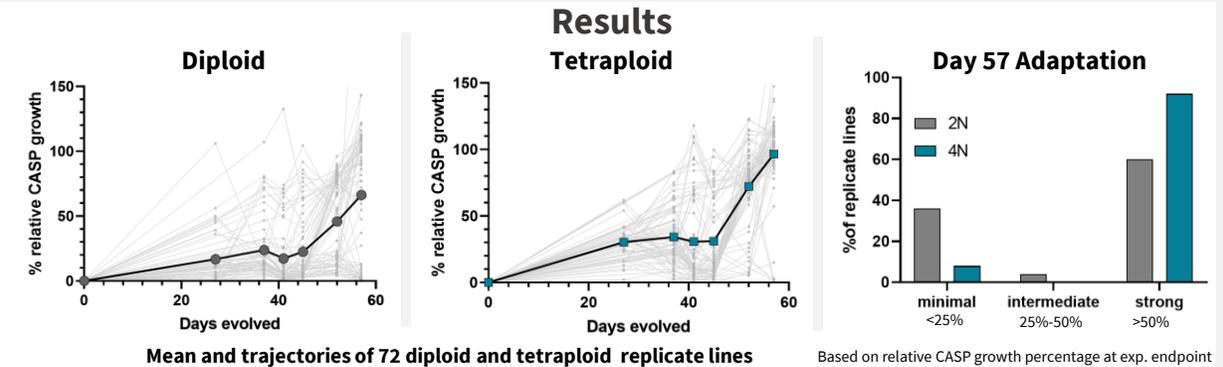
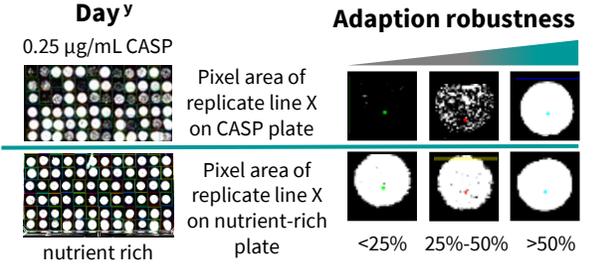
Commonly diploid but undergoes non-meiotic (parasexual) cycle to generate unstable tetraploid and aneuploid states and generate population variation.

In-vitro experimental evolution design

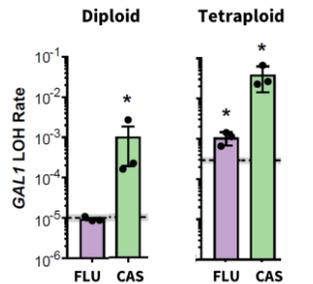


Quantification

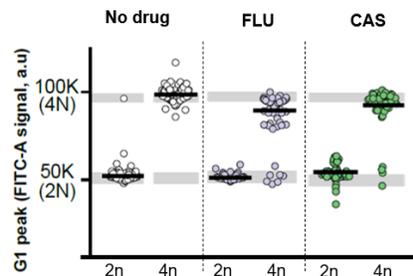
Pixel area ratios (% Relative CASP growth)



Short term antifungal drug exposure increases genome instability and drives ploidy changes in tetraploids



Genome Instability



Ploidy changes

Hypothesis



***C. albicans* tetraploid lines will adapt more rapidly than the diploids lines due to their ability to access a greater evolutionary landscape.**

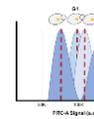
Future Directions

Have evolved isolates reached clinical resistance thresholds?



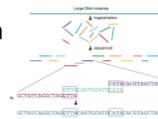
E-test phenotyping

What are the ploidy changes associated with long-term drug exposure?



Flow cytometry (total DNA staining)

What are the mutations associated with caspofungin resistance? Do they differ between diploids and tetraploids?



Whole-genome sequencing

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References

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