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Is Mitochondrial Recombination a Source of Reproductive Barriers?

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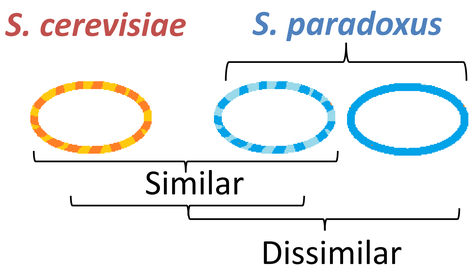
- ***Gabrielle McMillan*, Dr. Heather Fiumera***

**Presenter*

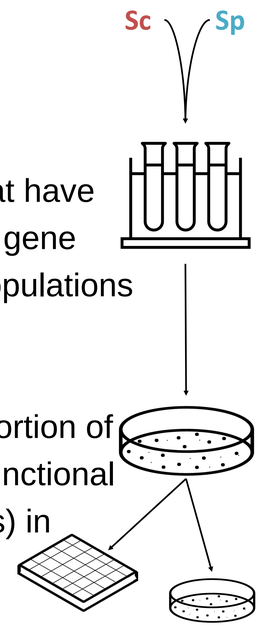
BACKGROUND:

- Postzygotic barriers play a significant role in the speciation process by reducing successful hybridization between species.
- Unicellular eukaryotes and some plants inherit mtDNA biparentally, creating an opportunity for novel recombinant mtDNA.
- Yeast species *Saccharomyces cerevisiae*(Sc) and *paradoxus*(Sp) contain mtDNA with similar and dissimilar gene orders:



- Hybridization between organisms with dissimilar gene order may produce nonfunctioning mtDNA.
- **I hypothesize that this difference in gene order causes aberrant recombination that deletes portions of the mtDNA and reduces hybrid fitness.**
- **I predict that recombination between mtDNA with differing gene arrangement will result in parts of the mtDNA being deleted, causing a reduction in fitness**.

METHODS



- Mate Sc with Sp that have similar or dissimilar gene order to produce populations of hybrids.
- Determine the proportion of hybrids that have functional mtDNA (high fitness) in each population.
- Use Restriction Fragment Length Polymorphism (RFLP) Assay to determine hybrid genotype.

DISCUSSION:

- If my hypothesis is correct, this will reveal a novel mechanism for postzygotic barriers within species that inherit mtDNA biparentally. Further examining this mechanism will help us understand the role of mtDNA in speciation.

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