

Departamento de Ciências da Vida

## Evolution of sex in fungi

The Yeast Genomics lab @ NOVA



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### Objectives

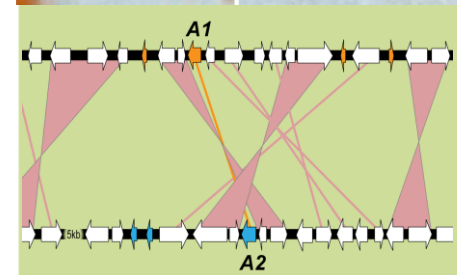
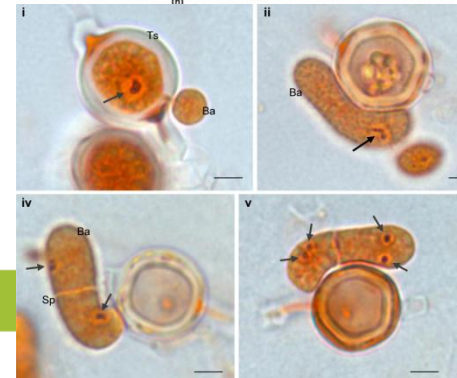
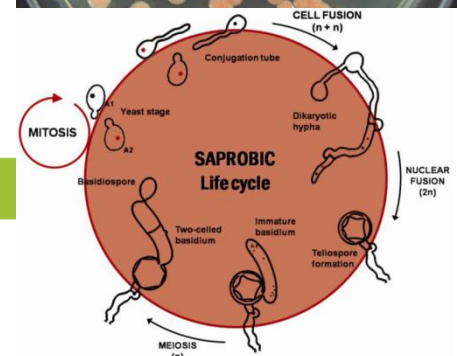
- Determine the genomic structure of the regions governing sexual identity in a group of red-pigmented yeasts related to important plant pathogens.
- Elucidate the evolutionary trajectory and genetic make-up of a novel fungal mating system recently identified in our laboratory in red yeasts.
- Study the transcriptional regulation of sex-determining genes in selected red yeast species at different stages of their life cycle.

### Methodology

- Whole-genome next-generation sequencing (NGS) of several strains of distinct mating types or “sexes” belonging to different red yeast lineages.
- Comparative genomics and phylogenetic analyses to assess gene organization and gene divergence within and between mating types.
- Chromosomal localization of sex-determining regions using Pulse-Field Gel Electrophoreses (PFGE) followed by chromoblot and/or Real Time PCR.
- Determine the expression patterns of sex-determining genes by Real Time RT-PCR or by deep-sequencing transcriptome profiling using RNA-seq.

### Expected Results

- Refine the current model of sex evolution in fungi in view of what we learned from this novel sex system.
- Gain insight in the regulation of sex development in red yeasts as a proxy to understand the interconnection between sex and pathogenicity in closely related fungal pathogens.



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