

Term **yeast** - jargon for unicellular fungus that grows reproductively by some type of budding or fission.

Like molds, yeasts are heterogeneous and distributed among a number of taxa.

1. Ascomycetous (Hemiascomycetous) yeasts - holocarpic forms capable of forming endogenous microspores
2. Basidiomycetous (Heterobasidiomycetous) yeasts - yeast phases of Uredinales and Ustilaginales
3. Imperfect yeasts - those yeasts with no known or observed sexual states*
4. Yeast forms of sexual and/or asexual hyphal fungi
"dimorphic fungi"

*blastomycetes

205/90a

***S. cerevisiae* (review of some main points of last lecture)**

1. Most studied eucaryotic microbe
2. Small organism 6-8 x 4-5 μm length x width for haploid
3. Cell wall = mannan-glucan type; chitin restricted to septum region
4. Multipolar = does not bud through old bud scars
5. 17 centromere-associated linkage groups/haploid cell
6. DNA content 3 to 4x that of *E. coli*
23 femptograms/haploid cell
150 kbp to 2500 kbp for chromosomes
0.5 x 10⁷ kbp total
7. Mitosis intranuclear membrane event
8. Asymetric cell division - thus, mothers and daughters can be distinguished.

228

Salient ultrastructural events of mitosis in *S. cerevisiae*

- a. Vacuole fission
- b. Satellite formation on SPB half bridge
- c. SPB duplication
- d. Vesicle-mediated bud emergence and SPB separation (buds more axial in haploids, more distal in diploids)
- e. Bud enlargement; spindle formation
- f. Nuclear migration to mother cell-bud juncture
- g. Nuclear division (intranuclear membrane mitosis)
- h. Primary and secondary septum formation (cytokinesis)
- i. Asymmetric cell separation -> bud & birth scars

229

Meiosis in *S. cerevisiae* = Ascosporogenesis

- 1. Ascosporogenesis -> 4 meiotic products (ascospores/tetrads)
 - 1. Induction in laboratory by transfer of diploids to nonfermentable substrate (usually acetate-containing media which promotes aerobic respiration)
 - 3. High sugar inhibits ascosporogenesis (insures high population densities) and promotes fermentation by glucose repression
- 4. As in mitosis, SPB satellite formation announces start of meiosis.

230b
