S. cerevisiae nomenclature

Advanced Genetics

1/28/2020
Life cycle

- **MATα** and **MATα**
- **Haploids**
  - Spore germination
  - Mitosis and cytokinesis
  - Ash1 mRNA localization in bud
  - HO-induced MAT switching in late G1
  - Mother and new daughter switch
  - Axial budding in haploids
  - ho-1 represses **HO** expression in daughter

- **Diploids**
  - Polar budding in diploids
  - Mating zygote formation
  - Stationary phase G1 arrest

**References**

http://www.genetics.org/content/191/1/33
Gene Nomenclature

Gene Names:
- Phenotypic abbreviation
- Three letters w/ Integer
- Italicized
- **Dominant** alleles (often WT)- **upper case**
- **Recessive** alleles- **lower case**
- e.g. *ADE12* vs *ade5*

<table>
<thead>
<tr>
<th>Gene symbol</th>
<th>Definition</th>
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<tr>
<td>ARG(^+)</td>
<td>All wild-type alleles controlling arginine requirement</td>
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<td>ARG2</td>
<td>A locus or dominant allele</td>
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<td>arg2-9</td>
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https://en.ppt-online.org/11843
Nomenclature of “Un-named” Genes

- Full gene name uses ORFs for identification

\[ \text{YKLO25C} \]

- Yeast unknown sequence
- A,B-P for chromosome I, II through XVI
- Left or right arm
- 25th ORF from centromere
- Watson (5’ → 3’) or Crick strand

\[ \text{e.g. the 25th ORF on the left arm of chromosome 11 on the minus strand} \]
### Alleles

**Typical alleles:**
- Gene symbol, hyphen, number
  - `arg2-9`
  - `act1-606`

**Complete or partial deletion:**
- `arg2-Δ1`
- `ade6-Δ1`

**Insertion of functional gene or gene replacement:**
- `ARG2::LEU2`
- `arg2Δ::LEU2`

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[https://en.ppt-online.org/11843](https://en.ppt-online.org/11843)
Proteins

- Use gene symbol
  - Without italics
  - Capitalized first letter
  - Followed by a p

- Example:
  - Arg2p
  - Ade5p
  - Cdc28p
Genotypes

• List mating type loci first (MATα vs. MATα)

• Haploid
  • List one copy of each gene
  • e.g. MATα act1-1 URA3 ADE2

• Diploid
  • Two copies of each gene, separated by a slash
  • e.g. MATα/MATα act1-1/ACT1 ura3Δ/URA3 ADE2/ADE2
Phenotypes

• 3-letter
• Corresponds to gene symbol
• Non-italicized
• Upper case first letter
• Example:
  • Ade for Adenine biosynthesis
  • WT: Ade⁺
  • Mutant: Ade⁻
Resources

• http://genome-www.stanford.edu/

• http://www.candidagenome.org/Nomenclature.shtml

• The Saccharomyces Genome Database (SGD)
  http://genome-www.stanford.edu/Saccharomyces/