

Exploring the Role of Clathrin During Ty1 Replication in *Saccharomyces cerevisiae*

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Abstract

Transposons are DNA elements that move or copy themselves from one position in the genome to another. Typically, transposable elements require the activity of several proteins of the cellular host in order to replicate. Ty1 is a transposon in baker's yeast (*Saccharomyces cerevisiae*) and is present in approximately 30 copies. In order to replicate, Ty1 encodes and expresses a small number of proteins, but also requires several yeast proteins. Our research is investigating the role of proteins in both the endomembrane system and secretory system in Ty1 replication. In particular, experiments are focusing on the possible role of the Clathrin protein complex in affecting Ty1 replication efficiency.

Challenges

Construction of a strain by simple yeast DNA transformation in order to measure the effect of Clathrin gene deletion alleles on Ty1 replication has been unsuccessful; this is likely due to the poor health of yeast strains with these deletions. More traditional strain construction methods using the mating of two haploids and the sporulation of the resulting diploid are now being employed (Figure 1).

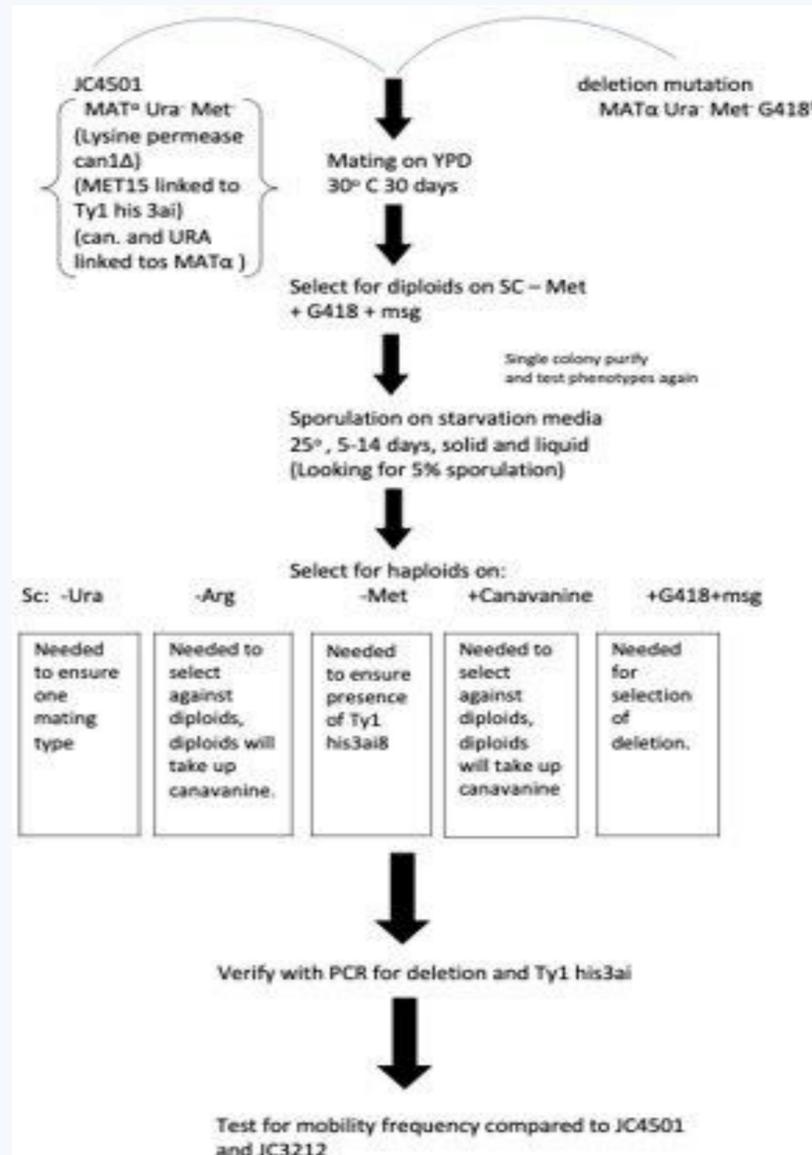


Figure 1. Method of strain construction. One haploid strain (JC4501) containing a genetic background to allow measurement of Ty1 replication is mated to another haploid strain containing a deletion of a gene coding for a Clathrin subunit. After selecting for diploids, meiosis is induced. Sporulation occurs, and haploids are selected for that contain the desired genetic background of both of the original haploid parents.

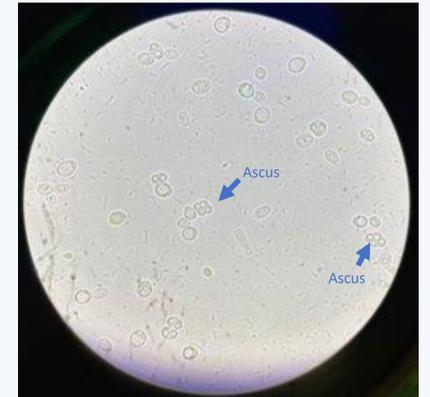


Figure 2. Field of View (1000x magnification with oil immersion) of yeast diploid cells and asci containing four spores (the result of a diploid cell undergoing meiosis and sporulation). Asci are indicated by a blue arrow.



Figure 3. Close up view of yeast spores in asci. 1000x magnification with oil immersion. Asci are indicated by a blue arrow.