

Glucose Signaling Pathway and Growth Conditions Regulate Gene Expression in Retrotransposon Ty2

Sezai Türkel^{a,*}, Özgür Bayram^{a,b}, and Elif Arık^a

^a Department of Biology, Faculty of Arts and Sciences, Uludag University, 16059-Bursa, Turkey. Fax: (+90) 0 22 42 94 18 99. E-mail: sturkel@uludag.edu.tr

^b Present address: Department of Molecular Microbiology and Genetics, Georg August University, Grisebachstr. 8, D-37077 Göttingen, Germany

* Author for correspondence and reprint requests

Z. Naturforsch. **64c**, 526–532 (2009); received January 30/March 5, 2009

Gene expression in the yeast retrotransposon Ty2 is regulated at transcriptional and translational levels. In this study, we have shown that the transcription of Ty2 is partially dependent on the membrane-bound glucose sensors Gpr1p and Mth1p in *Saccharomyces cerevisiae*. Transcription of Ty2 decreased approx. 3-fold in the *gpr1*, *mth1* yeast mutant. Moreover, our results revealed that the transcription of Ty2 fluctuates during the growth stages of *S. cerevisiae*. Both transcription and the frameshift rate of Ty2 rapidly dropped when the stationary stage yeast cells were inoculated into fresh medium. There was an instant activation of Ty2 transcription and a high level expression during the entire logarithmic stage of yeast growth. However, the transcription of Ty2 decreased 2-fold when the yeast cultures entered the stationary stage. The frameshift rate in Ty2 also varied depending on the growth conditions. The highest frameshift level was observed during the mid-logarithmic stage. It decreased up to 2-fold during the stationary stage. Furthermore, we have found that the frameshift rate of Ty2 diminished at least 5-fold in slowly growing yeasts. These results indicate that the transcription and the frameshift efficiency are coordinately regulated in the retrotransposon Ty2 depending on the growth conditions of *S. cerevisiae*.

Key words: Frameshift, Ty Elements, Glucose Sensing