

11 - Food Microbiology and Biotechnology - Oral Presentation

GABA Metabolism Pathway Genes Response to Heat Stress in *Saccharomyces Cerevisiae*

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A wide range of traditional foods produced by microbial fermentation contain GABA(γ -aminobutyric acid) and also has the possibility of providing new health-benefited products. The major factors affecting the production of GABA by microbial fermentation are temperature, pH, fermentation time and different media additives, therefore, these factors are under research to provide information for effective GABA synthesis. Persistent fluctuations temperature inhibits microorganism's growth and development during fermentation, that's why responses against various stress conditions have great importance in technological and economical manners.

The aim of this study was to investigate the effects of heat stresses on the expression profiles of GABA metabolism pathway genes and to identify GABA genes for heat stress response in commercial baker's yeast (*Saccharomyces cerevisiae*) using microarray technology and comparative statistical data analysis. The value 2.0 was chosen as the cut-off value in order to detect GABA genes included in the yeast.

S. cerevisiae (Izmit, Turkey) used in this study was cultured in YPD broth medium at 30°C. To ensure heat stress conditions, the pellet was resuspended in 10 mL of YPD medium and then each 1mL from this stock culture was inoculated in YPD broth (40mLx3) as 3 groups and incubated for 6h. These groups are; Control group(30°C), 25 to 37°C Heat-Shock-group and 37 to 25°C Temperature-Downshift-group. Total RNA-Isolation, cRNA synthesis, biotin labeling, hybridization and screening, Affymetrix GeneChip Expression Analysis were performed. The gene expression profile in yeast was monitored using the GeneChip methodology developed by Affymetrix. Transcriptional response was monitored using high density oligonucleotide arrays with 6x2 hybridizations with RNA. Data from all hybridizations and sequence normalization in the study were analyzed using GeneSpringGX 12.1(Agilent).

As a result, we identified GABA genes expression profile responses to heat stress, including heat shock and temperature shift, for yeast from our local company.

Keywords: GABA metabolism , Heat stress , *Saccharomyces cerevisiae*

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