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**Analysis of barosensitive mechanisms in yeast for Pressure Regulated Fermentation** KAZUKI NOMURA, HITOSHI IWAHASHI, Gifu University, AKINORI IGUCHI, TORU SHIGEMATSU, Niigata University of Pharmacy and Applied Life Sciences — **Introduction:** We are intending to develop a novel food processing technology, Pressure Regulated Fermentation (PReF), using pressure sensitive (barosensitive) fermentation microorganisms. Objectives of our study are to clarify barosensitive mechanisms for application to PReF technology. We isolated *Saccharomyces cerevisiae* barosensitive mutant a924E1 that was derived from the parent KA31a. **Methods:** Gene expression levels were analyzed by DNA microarray. The altered genes of expression levels were classified according to the gene function. Mutated genes were estimated by mating and producing diploid strains and confirmed by PCR of mitochondrial DNA (mtDNA). **Results and Discussion:** Gene expression profiles showed that genes of ‘Energy’ function and that of encoding protein localized in “Mitochondria” were significantly down regulated in the mutant. These results suggest the respiratory deficiency and relationship between barosensitivity and respiratory deficiency. Since the respiratory functions of diploids showed non Mendelian inheritance, the respiratory deficiency was indicated to be due to mtDNA mutation. PCR analysis showed that the region of *COX1* locus was deleted. *COX1* gene encodes the subunit 1 of cytochrome *c* oxidase. For this reason, barosensitivity is strongly correlated with mitochondrial functions.

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