

Abstract

Long-time research of chronologically aging yeast populations of *Saccharomyces cerevisiae* laboratory strains revealed that yeasts are able to differentiate into specialized cell types. Differentiation of liquid cultures growing in glucose rich medium and differentiation of colonies growing on solid glycerol medium has been previously studied. These populations create two fractions of cells with diverse morphology which adapt their metabolism and physiology to enable a long-term survival of the yeast population in environment with limited nutritional potential. In this study, yeast subpopulations isolated from colonies growing on solid glucose medium and liquid cultures cultivated in glycerol medium were characterized.

Newly isolated cell types were compared with already known cell types isolated from colonies and liquid cultures. Selected metabolic processes and stress resistance were analysed in studied populations. Based on previous studies of yeast differentiation, a spectrum of GFP-labelled marker proteins was chosen and production and localization of these marker proteins was monitored within yeast populations. Results of the analyses showed that type of medium and cultivation influence development and metabolism of each yeast cell type.

Key words: *Saccharomyces cerevisiae*, BY4742, cell differentiation, yeast populations, Q cells, NQ cells, Gly-Q cells, U cells, L cells, YPD-U cells, YPD-L cells