

THE *SACCHAROMYCES CEREVISIAE* RESPONSE TO VARIOUS STRESSORS STRONGLY DEPENDS ON THE GENOTYPE CHARACTERISTICS

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As it was already discussed, that key players in the formation of the genotype resistance are DNA repair, chaperone, and antioxidant repair systems as well as high levels of SH-groups, the presence of cell wall, stability of cells ultra-structural compartments, phases of the mitotic cycle, the energy provision, etc.

Here, we have addressed two questions: whether organisms with similar sensitivity to certain stressors measured as cell survival as well as primary induced levels of double-strand breaks would differ both: in their response depending on the physiological state; in their repair capacity?

Our work revealed that the *Saccharomyces cerevisiae* haploid strain BY4741 responds differently depending on the stressors and the physiological state. Cells in quiescent phase are more prone to Menadione treatment than to Zeocin. Additionally, the diploid strain D7ts1 is more sensitive to Zeocin when cells are in the beginning of stationary phase.

Concerning the other question, our results revealed the role of repair capacity depending on the genotype, and the recovery time.

In strain BY4741 increasing the recovery time to up to 60 min led to increase in the repair capacity of logarithmic cells. In strains 551 (haploid) and D7ts1 the most appropriate recovery time was found to be 30 min. After that a decrease in the repair capacity was observed.

Nevertheless, genotype differences have been obtained after combined treatment with *Clinopodium vulgare* plant extract and Zeocin. A well expressed decrease in the DSBs after the treatment and 30 min recovery time was calculated in D7ts1 while no effect was observed in strain 551.

By providing this experimental evidence, we aim to provide basis for further consideration of the physiological state and repair capacity in evaluation of the mechanisms of adaptation of *Saccharomyces cerevisiae*.