Time dependent physiological characterization of yeast oxidative stress response and growth modulation of protein kinase/phosphatase mutants

The objective of the project was to investigate the time-dependent batch growth effects of oxidative environmental conditions on protein kinase (PK) and phosphatase (PP) deletion mutants and relevant wild type strains of Saccharomyces cerevisiae. To achieve this goal, 44 different PK and PP mutants were selected for their known activities in various stress response pathways, including oxidative stress, and were investigated for their response to oxidative stress. Hydrogen peroxide was used as the oxidizing agent at a number of different concentrations ranging from mild to moderate stress (0.25, 0.50 and 1.0 mM). Understanding the growth physiology of S. cerevisiae allows us to estimate the link between genotype and stress-response phenotype. Growth physiology parameters, such as growth rate, diauxic shift times, stress-induced stasis times, were measured in fermentative batch cultures as important indicators of cellular fitness. We used a high-throughput microfermentation system (BioLector, m2p-labs) to retrieve these indicators of cellular fitness and perform our batch fermentations.

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