Calcineurin – Crz1 Signaling in Low pH Response in *Saccharomyces cerevisiae*

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The acid treatment of *Saccharomyces cerevisiae* cultures with dilute sulphuric acid at pH 2.0-2.5 for cells recycle in subsequent fermentations have a negative effect on the yeast life cycle. In a previous work, we established that low concentration of sodium ions conferred protection to yeast cells exposed to acid stress. Our observations also suggested that the systems involved in maintaining the plasma membrane potential (PMA1 - H⁺-ATPase and secondary transport systems) were linked to the acid stress response. In the present study, we focused on calcium signaling events and in the role of Snf1 kinase in response to acid stress. Yeast cell cultures (OD<sub>600nm</sub> ~ 1.0) were harvested, washed twice and suspended in an aqueous solution previously adjusted to pH 2.0 with HCl. Aliquots were collected after 0, 30, and 60 min of incubation, washed, diluted and seeded on YPD and incubated for 48-72h. The results were expressed as % cfu. The cytosolic calcium was measured by the aequorin based method or by using the Oregon Green 488 BAPTA-1, AM. Our results showed that acid pulses produced cytosolic calcium signal which were pH dependent. Experiments using mutants in genes involved in calcium homeostasis showed that the calcium signal is triggered by the entry of calcium from extracellular medium and by release of calcium from internal stores. The effect of acid pulses on viability of yeast mutants involved in calcium metabolism demonstrated that the acid stress response is dependent on calcium metabolism and blocked by FK506. We also tested the contribution of Snf1 kinase to the response to low pH. Mutant lacking the Snf1 kinase is sensitive to low pH and this defect is probably related to the role of this kinase in the control of glucose metabolism.

Key words: *Saccharomyces*, acid stress, calcium

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