

Functional Characterization of Starvation-Induced Lysosomal Activity in *Saccharomyces cerevisiae*

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Starvation is known to induce significant alterations in lysosomal enzymes, and reduced concentrations of glucose caused an increased in the activity of several lysosomal enzymes. Therefore, to evaluate the antimicrobial activity among the lysosomal functions under starvation conditions, we selected 0, 5, 10, 20 and 40 g/l of glucose added YP medium to culture *Saccharomyces cerevisiae*, and then lysosomal fractions were isolated from *S. cerevisiae*. The lysosomes isolated from each condition, exhibited increased antimicrobial activity against *Escherichia coli* according to the decrease of glucose concentrations. In addition, a starvation-dependent increase in lysosomal activity coincided with increased lysosome intensity at the cytosol and distinct proteins expression of lysosomes in *S. cerevisiae*. It was also found that the lysosomes have antimicrobial activity against 7 different microorganisms including *E. coli*, and starvation-induced lysosomes showed enhanced antimicrobial activity than those from normal lysosomes. These results suggest the possibility that lysosomal alterations during starvation may be good conditions to activate lysosomes for developing efficient antimicrobial agents.