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THE ROLE OF SPHINGOLIPID METABOLISM GENES IN THE RESPONSE OF *SACCHAROMYCES CEREVISIAE* CELLS TO STARVATION FOR ESSENTIAL NUTRIENTS

METELLI A.*,**, MATMATI N.**, ACHILLI A.*, LANCIONI H.*, BABUDRI N.*

*) Dipartimento di Biologia Cellulare e Ambientale, Università di Perugia, Via Elce di sotto, 06100 Perugia (Italia)
**) Department of Biochemistry and Molecular Biology, Medical University of South Carolina, Charleston, SC. (USA)

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The goal of the presented research has been to investigate the possible role of genes involved in the sphingolipid metabolism in the response of the yeast *Saccharomyces cerevisiae* cells to environmental stresses such as starvation for essential nutrients (aminoacids or nitrogen bases for auxotrophic strains). We focused on the genes ISC1, SUR1, SUR4, IPT1, CGS2 and SCS7 whose products are known to be fundamental for a proper response of yeast cells to various stressful conditions. First we compared the survival of the auxotrophic yeast strain BY4741 (Mat a *his 3Δ1 leu 2Δ0 ura 3Δ0 met15Δ0*) starved for leucine with that of isogenic strains deleted in the above mentioned genes. The survival was determined by spot tests and survival curves at different times (1-2-3 days) of starvation. Our results showed that the strain defective in the gene ISC1(*ISC1Δ*) was much more sensitive than the others to leucine starvation. Then we tested the strain *ISC1Δ* for histidine, methione and uracil starvation confirming its higher sensitivity with respect to the wild-type strain. On the basis of these results we conclude that the product of the gene ISC1 is involved in the response of yeast cells to nutritional stress. To understand the role of ISC1 during starvation for nutrients we wondered if its deletion could jeopardize the possibility of yeast strain to adopt the proteolytic pathway of autophagy which is known to extend yeast cells chronological longevity when they are starved for aminoacids. To monitoring the autophagy process we applied a method based on the unique properties of the fluorescent dye FM 4-64 to follow the accumulation of autophagic bodies. In a preliminary experiment autophagy was monitored in wild-type and *ISC1Δ* cells grown for 4 hours in minimal medium without any essential aminoacids and without uracil. In this condition we found that *ISC1Δ* cells cannot induce autophagy compared to BY4741 wild type strain. The next steps will be to monitor autophagy in wild-type and *ISC1Δ* cells under the same experimental conditions used for the determination of survival. This could help to find a possible correlation between the autophagy-deficient phenotype of *ISC1Δ* cells and their higher sensitivity to the essential nutrients deprivations tested.