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World Yeast Congress

May 14-15, 2018 | Montreal, Canada

Specific synthesis of trehalose and polyols are protective factors against environmental stress in *Candida albicans*

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Candida albicans still remains the most prevalent fungal pathogen in humans. The MAP-kinase HOG1 pathway plays an essential role in the pathobiology of this opportunistic yeast, including the colonization of the gastrointestinal tract in mouse or the defensive response against several environmental injuries. The latter, encompass mechanisms to face both oxidative and osmotic stress treatments. Here, we show that one of the main components of this defensive response consists of the intracellular protective accumulation of the non-reducing disaccharide trehalose and two polyols, glycerol and D-arabitol, an accumulation that occurs in a stress-specific dependent manner. Thus, oxidative exposures promoted a marked increase in both trehalose and D-arabitol in the wild type strain, RM-100 (and several standard genetic backgrounds), whereas the glycerol content remained virtually unaffected with respect to basal (untreated) levels. In contrast, osmotic challenges induced the significant storage of glycerol accompanied by minor changes, or even a slight drop, in the intracellular content of trehalose and D-arabitol. We examined the hypothetical role in this process of the MAP kinase Hog1, which regulates the protective responses in C. albicans against both oxidative and osmotic stress. Interestingly, unlike glycerol synthesis, the stress-induced trehalose accumulation was always Hog1-independent, whereas the ability to synthesize D-arabitol was only partially dependent on a functional Hog1 pathway, at least under our experimental conditions.

Speaker Biography

J C Argüelles has completed his PhD in Biology (1987) at the University of Murcia and Post-doctoral studies from Institute of Biomedicine (CSIC, Madrid, Spain) and from the Laboratory of Molecular Cell Biology at the Catholic University of Leuven (Belgium). He is currently working as Professor of Microbiology and has published more than 50 papers in reputed journals and has been serving as an Editorial Board Member. Furthermore, he is also engaged in the Social and Humanistic Features of Science, has published two books on Scientific Historiography; participated on Forums on the Dissemination of Science and is a writer of popular science articles in some leading newspapers.

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