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Oxidative stress response and longevity: Learning from yeast lessons

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Although aging is likely to be a multifactorial process, several evidences show that oxidative stress is connected to life span. Many questions remain unanswered: oxidative stress does indeed contribute to ageing; do ROS act purely as random, destructive agents or as regulators of pathways of stress response and ageing; is it the absolute level of oxidative stress or the response to oxidative stress, or a combination of both, that determines life span? Interest in the factors that determine longevity has increased since the life expectancy has increased and the world leading causes of death are age-related diseases, such as cancer and neurodegenerative diseases. The use of the yeast *Saccharomyces cerevisiae* as an experimental model in biochemical studies has enabled the understanding of basic cellular and molecular processes. Even taken into consideration the vast differences in complexity between yeast and humans, the study of ageing and oxidative stress response in yeast has provided key insights into pathways that modulate human longevity. The entire genome sequence of yeast has been elucidated and it is amenable to genetic modifications, which facilitates the identification of drug targeting genes or stress response pathways. A substantial portion of human protein-coding genes can actually substitute for that of the yeast. In addition, *S. cerevisiae* has similar antioxidant responses to mammals and 30% of known genes involved in human diseases have yeast functional homologues. So, we have been using the yeast model to investigate the role of antioxidant defenses in cellular longevity and the molecular basis of neurodegeneration.

Biography

Elis Eleutherio has completed his PhD from UFRJ. She is the Head of Laboratory of Investigation of Stress Factors (Laboratório de Investigação de Fatores de Estresse – LIFE) at Institute of Chemistry, UFRJ. She has published more than 60 papers in reputed journals and has supervised 10 PhD and 15 MSc theses.

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