

A SWEET WAY TO BECOME STRONGER: AN EXAMPLE FROM HUMAN FUNGAL PATHOGEN *CANDIDA ALBICANS*

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There are more than 300,000 known species of fungi, but only a few of them can cause human infections. One of them, *Candida albicans*, is a relatively harmless organism, which can occupy the skin, oral cavity gastrointestinal tract and genitalia of healthy people. However, this fungus can take an advantage of immune system defects and cause a wide range of affections from mild superficial thrush to fatal systemic infections. There are lots of factors which make *C. albicans* so effective pathogen; among them are the ability to consume different nutrients (e.g. sugars) and to resist to different stresses.

When *C. albicans* cells enter the bloodstream, they are attacked by host cells, phagocytes, which cause oxidative stress to fungal cells. Also, in the human they are exposed to glucose in the bloodstream. Thus, we hypothesized that nutrients sensing might influence stress responses. Indeed, in laboratory environment *C. albicans* cell, exposed to glucose, became more resistant to different stresses. Also, it was less sensitive to killing by neutrophils, cells isolated from human donors, when glucose was added. Using different types of modified glucose we have been able to prove that *C. albicans* cells just need to sense glucose, not necessarily to consume it, in order to become more resistant to oxidative stress. *C. albicans*, like other yeasts, has 3 distinct mechanisms for glucose sensing, which form a complicated network. We are now investigating the role of major components of this network in the phenomenon of glucose-enhanced oxidative stress resistance.