

## DYNAMIC ENVIRONMENTAL RESPONSES OF *C. ALBICANS* THAT CONTRIBUTE TO PATHOGENICITY

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*Candida albicans* is the most common fungal pathogen in humans, causing a variety of health problems ranging from mucosal to systemic infections. Generally harmless, it is present in 40-80% of the normal population, but in immunocompromised individuals it can proliferate and access different internal organs and tissues causing potentially fatal infections. *C. albicans* occupies a number of different niches in the human host. This is where the pathogen is exposed to a variety of nutrients, many of them different from more classical ones (e.g. glucose) which are the basis for most studies conducted so far. The shift from harmless commensal to opportunistic pathogen requires *C. albicans*' ability to grow in poor nutrient niches and survive the diversity of stresses it encounters in the host.

Many of these stresses, such as therapeutic drugs or osmotic stress act on the cell wall of the pathogen. This is the main interface between *C. albicans* and its host, a multi-layered interface which proves to be extremely flexible and dynamic when exposed to different nutrients. We are studying how the variety of nutrients found in the host modulate adaptation and stress responses and how the cell wall must quickly adjust under these conditions. In doing so it relies on mechanisms of constant remodelling and maintenance of cell wall integrity. More importantly we have found that certain nutrients and in particular poor nutrient niches in the host provide a fitness advantage to the pathogen. Having adapted to these niches, *C. albicans* also increases its resistance to a number of antifungals, which are currently the only available weapon against fungal infections.

In this study, we show how the nutrients taken up strongly influence the cell wall architecture and hence resistance of *C. albicans* to certain stresses. These findings are likely to have a major impact on the behaviour of this pathogen inside the human host and may be of major clinical importance.