



## Glycoshield initiative: Exploring the role of fungal cell surfaces in infection processes

### Project Coordinator



**Dr. Jesus Pla**

Departamento de Microbiología II  
Facultad de Farmacia  
Universidad Complutense de Madrid (UCM)  
Plaza de Ramón y Cajal s/n,  
28040 Madrid  
Spain  
Tel.: +34-91-394 1617  
E-Mail: [jesuspla@farm.ucm.es](mailto:jesuspla@farm.ucm.es)

### Project Description

The surface of fungal organisms is an extremely important factor in a number of processes: Via the molecules that settle on or are attached to the surface, fungi are able to control adhesion and invasion mechanisms, as well as elements of its cell communication. Moreover, recent discoveries indicate that cell surfaces on fungal organisms play an essential role in the course of infection diseases. Seven researcher teams from three different countries have now founded the *Glycoshield* initiative under the umbrella of the *ERA-NET Pathogenomics* to explore fungal cell surfaces on a molecular and biochemical level. With the help of new approaches they want to determine possible disease-relevant mechanisms connected with processes in or on the surface. The studies will mainly be based on the two pathogenic fungi *Candida albicans* and *Cryptococcus neoformans*, which will serve as models for the different patterns of disease-causing mechanisms.

Whereas the *Candida albicans* yeast is a normally harmless inhabitant of the human body, it can pose a serious danger for people with a weak immune system. *Cryptococcus neoformans* is an infection agent that causes problems on the skin or in the lung if it is inhaled. To identify the general aspects of pathogenic surface-related factors, the researchers in the *Glycoshield* initiative want to combine a number of different scientific approaches from molecular genetics, biochemistry, structural biology and cell biology. One aspect of the analyses will be a focus on the targeted genetic engineering of fungi to create mutants with defined defects in the surface with the aim of unravelling structural or functional changes. Using a variety of *in vitro*, *ex vivo* and *in vivo* models, the role of fungal cell surface molecules in the interaction with mammalian hosts will also be examined and characterised by genome-wide screenings, with a focus on carbohydrates, assumed to be an essential factor. Through the use of all of these methods, the scientists hope to shed light on the still unclear complex interactions of fungal cell surface molecules during infection processes in the different stages of pathogenicity.

