



# **$\beta$ -1,2 Oligomannose Adhesin Epitopes Are Widely Distributed over the Different Families of *Candida albicans* Cell Wall Mannoproteins and Are Associated through both N- and O-Glycosylation Processes**

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$\beta$ -1,2-Linked mannosides ( $\beta$ -Mans) are believed to contribute to *Candida albicans* virulence. The presence of  $\beta$ -Mans has been chemically established for two molecules (phosphopeptidomannan [PPM] and phospholipomannan) that are noncovalently linked to the cell wall, where they correspond to specific epitopes. However, a large number of cell wall mannoproteins (CWMPs) also express  $\beta$ -Man epitopes, although their nature and mode of  $\beta$ -mannosylation are unknown. We therefore used Western blotting to map  $\beta$ -Man epitopes for the different families of mannoproteins gradually released from the cell wall according to their mode of anchorage (soluble, released by dithiothreitol,  $\beta$ -1,3 glucan linked, and  $\beta$ -1,6 glucan linked). Reduction of  $\beta$ -Man epitope expression occurred after chemical and enzymatic deglycosylation of the different cell wall fractions, as well as in a secreted form of Hwp1, a representative of the CWMPs linked by glycosylphosphatidylinositol remnants. Enzyme-linked immunosorbent assay inhibition tests were performed to assess the presence of  $\beta$ -Man epitopes in released oligomannosides. A comparison of the results obtained with CWMPs to the results obtained with PPM and the use of mutants with mutations affecting O and N glycosylation demonstrated that both O glycosylation and N glycosylation participate in the association of  $\beta$ -Mans with the protein moieties of CWMPs. This process, which can alter the function of cell wall molecules and their recognition by the host, is therefore more important and more complex than originally thought, since it differs from the model established previously with PPM.

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