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Functional characterization of two novel surface mannoproteins, Wsc1p and Wml1p in the human fungal pathogen *Cryptococcus neoformans*

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Environmental stresses are sensed by transmembrane sensors, the WSC family, Mid2p and Mtl1p in *Saccharomyces cerevisiae*. These surface sensor proteins are highly O-mannosylated and involved in the cell wall integrity signaling pathway. In this study, we identified two putative cell wall sensors WSC1 (CNAG_03328) and WML1 (WSC/Mtl2-Like, CNAG_01255) in the opportunistic human fungal pathogen *Cryptococcus neoformans* by *in silico* analysis. The overall protein sequence similarities between *C. neoformans* proteins to *S. cerevisiae* sensor proteins are quite low. CnWsc1p shows 16.8% and 21.3% identities with *S. cerevisiae* Wsc1p and *S. pombe* Wsc1p respectively. CnWml1p is related to SpWsc1p and ScMtl1p with 19.3% and 16.7% identities respectively. We observed that the CnWsc1p and CnWml1p were expressed as high molecular weight (MW) forms much larger than the predicted size in the wild-type strain. Noticeably, CnWsc1p with low MW was accumulated in the Cnktr3Δ mutant who has a defect in O-glycosylation. Sub-cellular fractionation experiments showed the enriched expression of CnWsc1p and CnWml1p in the cell wall/membrane fraction indicating their expression at cell surface. Furthermore, whereas no detectable defects were shown in the Cnwcs1Δ and Cnwml1Δ single mutants, the Cnwcs1wml1Δ double mutant displayed apparent cell growth defects under osmotic stresses. These results suggest that *C. neoformans* Wsc1p and Wml1p are O-mannosylated surface proteins with important roles in responding to osmotic stresses.

Biography

Eun Jung Thak has completed Bachelor of Science at the age of 24 years from Chung-Ang University. He is now a Post graduate student in the Masters course of Molecular Biology under the supervision of Professor H A Kang at Department of Life Science, Chung-Ang University in Seoul, Korea.

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