IDENTIFIKASI PROTEIN ANTIGENIK SPESIFIK BIOFILM SEBAGAI KANDIDAT BIOMARKER KANDIDIASIS

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ANTIGENIC PROTEIN; CANDIDA ALBICANS
KKC KK TK 03 / 11 Ang i

ABSTRACT

Identification Biofilm Specific Antigenic Protein As a Candidate of Candidiasis Biomarker

Candida albicans is a human commensal and opportunistic pathogen that participates in biofilm formation on host surface and also in medical devices. Protein profiles of fungal biofilm have not investigated in details, although such profile are believed to play critical roles in fungal biofilm formation. We used *Sodium dodecyl sulfate – polyacrilamide gel electrophoresis* (SDS-PAGE) joined with Western blotting to analize biofilm specific antigenic protein of *C. albicans* by investigating the reactivities of antibodies in sera from mice to antigenic protein of biofilm formed on cellulose nitrate membrane compared to planktonic form. The result, we analize the antigenic protein profile of *C. albicans* biofilm includes proteins with molecular weight 76.4 kDa, 70.6 kDa, 67.1 kDa, and 52.1 kDa. Also, antigenic protein profile of *C. albicans* planktonic includes proteins with molecular weight 76.4 kDa, 70.6 kDa, 64.8 kDa, 52.1 kDa, 47.4 kDa and 40.3 kDa. Based on comparation of antigenic protein profile of biofilm and planktonic, we analize the biofilm specific antigenic protein, that is protein with molecular weight 67.1 kDa. This biofilm specific antigenic protein of *C. albicans*, is a candidate to biomarker of candidiasis.

Key word: *Candida albicans*, biofilm, SDS-PAGE, Western blotting, antigenic protein, biomarker.

SUMMARY

Identification Biofilm Specific Antigenic Protein As a Candidate of Candidiasis Biomarker

Candida albicans is the commensally fungus in the gastrointestinal tract, oral cavity and vagina. Colonization form of *C. albicans* called biofilm. Biofilm arranged by various morphology, like yeast, hyphae cell, covered by extracellular matrix. In biofilm, hyphae is useful in invation process. Moreover, extracellular matrix of biofilm protects *C. albicans* from host immunity. So that, biofilm categorized as pathogenic type of *C. albicans*. The other type of *C. albicans* is planktonic. This type is not pathogenic because arranged by yeast cell only. The objective of this study was to analize the antigenic protein profile of *C. albicans* biofilm extracted by β-mercaptoetanol and zymolyase toward anti *C. albicans* serum as well as to analize the antigenic protein profile of *C. albicans* planktonic extracted with β-mercaptoetanol and zymolyase toward anti *C. albicans* serum. So that, can analize the biofilm specific antigenic protein profile of *C. albicans.*

The analysis of biofilm specific antigenic protein of *C. albicans* was done by combination of proteomic and serologic approach, namely immunoproteomic. Antibody of anti *C. albicans* used to identificate of antigenic protein is produced by mice as host. Biofilm was made by growing suspension of *C. albicans* pellet in the cellulose nitrate membrane that was placed onto SDA medium. The presence of solid matter as a support and nutrition deficiency condition would trigger the biofilm formation. Then we extract the biofilm protein by chemical extraction using β-mercaptoetanol and enzymatic degradation using zymolyase enzyme. The use of two methods because the structure of the cell wall and biofilm matrix are very strong and tough. Finally, the identification of biofilm specific antigenic protein was done by SDS-PAGE and Western blotting analysis. From the result of this research, identified some proteins with molecular weight of 76.4 kDa, 70.6 kDa, 67.1 kDa, 52.1 kDa, and 40.5 kDa as *C. albicans* biofilm specific proteins. The antigenic protein profile of *C. albicans* biofilm are proteins with molecular weight 76.4 kDa, 70.6 kDa, 67.1 kDa, and 52.1 kDa. And the antigenic protein profile of *C. albicans* planktonic are proteins with molecular weight 76.4 kDa, 70.6 kDa, 64.8 kDa, 52.1 kDa, 47.4 kDa and 40.3 kDa. So that, a protein with molecular weight 67,1 kDa is an biofilm specific antigenic protein. This protein is a candidate of candidiasis biomarker. Non-biofilm specific antigenic protein are protein with molecular weight of 84.4 kDa, 69.5 kDa, and 62.5 kDa. This protein can be used for medicine designing for candidiasis.

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