



Protein extraction from *Candida albicans* after interaction with *Streptococcus gordonii*

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CONTEXT

Human mucosal surfaces are colonized by diverse microbial communities. *Candida albicans* colonizes human mucosal surfaces and is a major systemic fungal pathogen. Biofilm formation and virulence are both linked to the ability to transition from the yeast (blastospore) growth form to the filamentous (hyphal) growth form.

The aims of this research were to better understand the interactions between the oral bacteria *Streptococcus gordonii* and the disease associated fungus *C. albicans*.

Specifically, we analyzed the effects of *S. gordonii* DL1 on activation of MAP kinases Cek1 and Mkc1 which impact *C. albicans* morphogenesis from blastospore to the filamentous hyphal form, and the role of H₂O₂ in this interaction⁽¹⁾.

MATERIAL

- Precellys®24.
- Precellys® kit: 03961-1-004 (0.5 mm glass beads).
- Sample: *C. albicans* cells treated with *S. gordonii* DL1 with or without H₂O₂ stimulation.
- Buffer: Lysis buffer Tris-HCl, pH 5, glycerol, TritonX100, SDS, NaCl, NaF, Sodium orthovanadate, glycerol phosphate, sodium pyrophosphate, EDTA, PMSF with 1x protease inhibitor cocktail (Sigma).

1) C. V. Bamford et al, Infection and Immunity, Sept. 2009, p3696-3704. doi:10.1128/IAI.00438-09



CONCLUSION

These observations suggest that interactions between *C. albicans* and *S. gordonii* involve physical (adherence) and chemical (diffusible) signals that influence the development of biofilm communities. Thus, bacteria may play a significant role in modulating *Candida* carriage and infection processes in the oral cavity.

Precellys®24 provided a **simple** and **speedy** method of homogenizing the *C. albicans* cells to produce an array of cell wall samples which could **easily** and **quickly** be analysed at the **same time with confidence** that the samples were comparable.

PROTOCOL

- Precellys®24: 5000 rpm, 4x30 s, 30 s breaks on ice.
- Centrifugation at 13,000 rpm at +4°C for 10 minute s.
- *C. albicans* cell wall samples were analyzed using SDS-PAGE and Western Blot techniques.

RESULTS

Co-incubation of *C. albicans* with *S. gordonii* DL1 cells led to activation of Cek1. The presence of *S. gordonii* cells also suppressed the H₂O₂-induced phosphorylation of Mkc1. Thus, the activities of these MAP kinases differentially respond to the presence of, or contact with, *Streptococcus* bacteria in the environment (Fig.1).

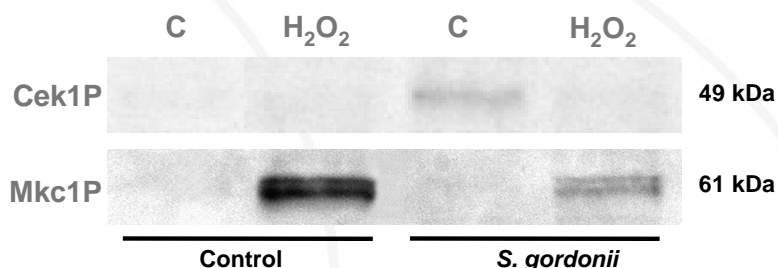
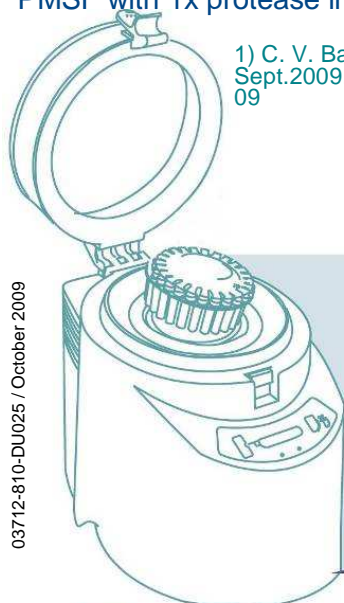


Fig. 1: Western immunoblot analysis of effects of 10mM H₂O₂ on phosphorylation of *C. albicans* MAP kinases after 20 min in the presence or absence of *S. gordonii*

These results suggest that filamentation of *C. albicans* may be biochemically promoted by streptococci. In addition, in the presence of streptococci, H₂O₂ is unlikely to be the main cause of increased hyphal development.



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Problem



Solution



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TECHNOLOGIES

For more details, please contact
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