

# Protein extraction from Candida albicans after interaction with Streptococcus gordonii

Department of Oral and Dental Science, Univ. of Bristol - UK

#### 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  $H_2O_2$  in this interactionl<sup>(1)</sup>.

### 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 H<sub>2</sub>O<sub>2</sub> stimulation.
- DL1 with or without  $\rm H_2O_2$  stimulation. - Buffer: Lysis buffer Tris-HCI, pH 5, glycerol, TritonX100, SDS, NaCl, NaF, Sodium orthovanadate, glycerol phosphate, sodium pyrophosphate, EDTA, PMSF with 1x protease inhibitor cocktail (Sigma).

## PROTOCOL

- Precellys®24: 5000 rpm, 4x30 s, 30 s breaks on ice.
- Centrifugation at 13,000 rpm at +4℃ 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  $\rm H_2O_2$ -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).

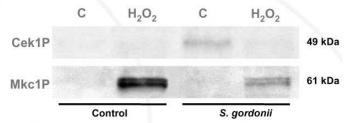


Fig. 1: Western immunoblot analysis of effects of 10mM  $H_2O_2$  on phosphorylation of C. albicans MAP kinases after 20 min in the presence or absence of S. gordonii

These results suggest that filamentation of C. albicans may be biochemically promoted by streptococci. In addition, in the presence of streptococci,  $H_2O_2$  is unlikely to be the main cause of increased hyphal development.



## CONCLUSION

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

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.

Problem

Solution







For more details, please contact precellys@bertin.fr



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#### ■東京

〒162-0805 東京都新宿区矢来町 113番地 TEL(03)3235-0661(代) FAX(03)3235-0669

#### ■大阪

〒532-0005 大阪市淀川区三国本町2丁目12番4号 TEL(06)6396-0501(代) FAX(06)6395-2588

#### ■福岡

〒812-0054 福岡市東区馬出 1 丁目 2 番 23 号 TEL(092)631-1012(代) FAX(092)641-1285

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